55-1520-238-T-2

TM 55-1520-238-T-2

ELECTRICAL SYSTEM

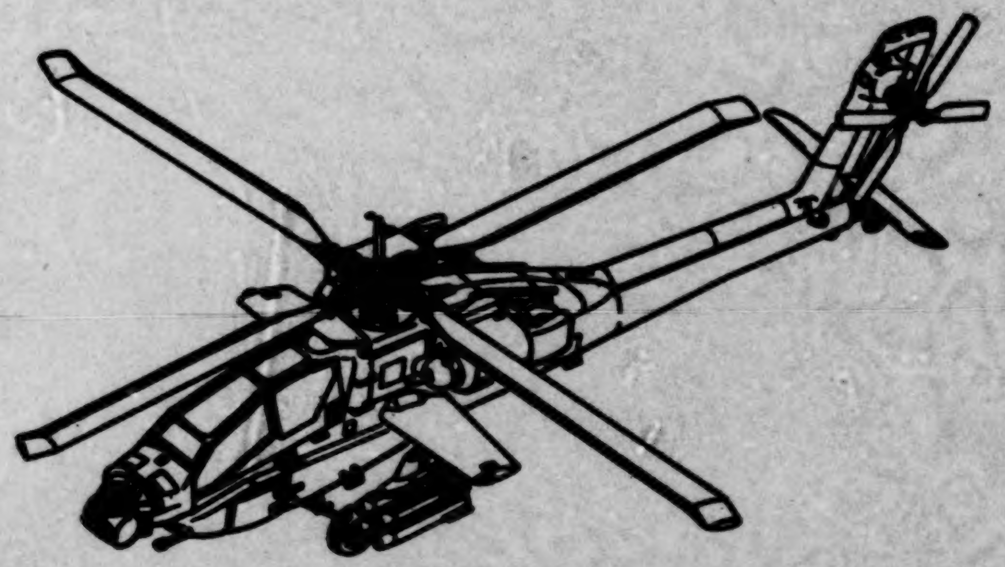
TECHNICAL MANUAL

AVIATION UNIT AND INTERMEDIATE TROUBLESHOOTING MANUAL

FOR

ARMY AH-64A HELICOPTER

VOLUME 2



This copy is a reprint which includes current pages from Changes 1 through 7.

HEADQUARTERS DEPARTMENT OF ARMY

D 101.11:

CHANGE
NO. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 8 April 1987

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
-----	i/ii
9-11 and 9-12	9-11 and 9-12
9-39 and 9-40	9-39 and 9-40
9-157 and 9-158	9-157 and 9-158
9-169 through 9-172	9-169 through 9-172
9-329 through 9-332	9-329 through 9-332
9-365 through 9-370	9-365 through 9-370
9-383 and 9-384	9-383 through 9-384.1/9-384.2
9-385 and 9-386	9-385 and 9-386
9-393 through 9-400	9-393 through 9-400
9-409/9-410	9-409/9-410

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

CHANGE
NO. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 20 May 1987

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i/ii	i/ii
---	9-12.1 Blank/9-12.2
9-13 through 9-20	9-13 through 9-20
9-37 and 9-38	9-37 and 9-38
9-41 and 9-42	9-41 and 9-42
9-47 through 9-52	9-47 through 9-52
9-103 through 9-106	9-103 through 9-106
9-169 and 9-170	9-169 and 9-170
9-225 through 9-232	9-225 through 9-232
9-255 and 9-256	9-255/9-256
9-257 and 9-258	9-257 and 9-258
9-275 through 9-282	9-275 through 9-282
---	9-302.1/9-302.2
9-329 through 9-332	9-329 through 9-332
9-337 and 9-338	9-337 and 9-338
9-365 through 9-370	9-365 through 9-370
9-383 and 9-384	9-383 and 9-384
9-397 and 9-398	9-397 and 9-398

2. Retain this sheet in front of manual for reference purposes

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

TM 55-1520-238-T-2
C 4

CHANGE
NO. 4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 31 August 1987

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
9-1 through 9-12	9-1 through 9-12
9-35 blank/9-36	9-35 blank/9-36
---	9-36.1 through 9-36.4
9-37 and 9-38	9 37 blank/9-38
9-39 through 9-44	9-39 through 9-43/9-44
9-45 blank/9-46	9-45 and 9-46
9-47 through 9-54	9-47 through 9-54
9-55 through 9-60	---
9-61 and 9-62	9-61 blank/9-62
9-63 and 9-64	9-63 and 9-64
9-155 through 9-160	9-155 through 9-160
9-169 through 9-176	9-169 through 9-176
9-179 through 9-182	9-179 through 9-181/9-182
9-205 through 9-212	9-205 through 9-212
9-223 through 9-228	9-223 through 9-228
9-233 and 9-234	9-233 and 9-234
9-237 blank/9-238	9-237 blank/9-238
9-239 through 9-255/9-256	9-239 through 9-256
9-275 through 9-284	9-275 through 9-284
9-302.1/9-302.2	9-302.1/9-302.2
9-309 through 9-312	9-309 through 9-312
---	9-312.1/9-312.2

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

TM 55-1520-238-T-2
C 5

CHANGE
NO. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 8 December 1987

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i/ii	i/ii
9-1 through 9-10	9-1 through 9-10
9-85 through 9-92	9-85 through 9-92
9-99 through 9-106	9-99 through 9-106
9-113 and 9-114	9-113 and 9-114
9-123 through 9-128	9-123 through 9-128
---	9-128.1/9-128.2
9-129 through 9-132	9-129 through 9-132
---	9-132.1 blank/9-132.2
9-133 through 9-138	9-133 through 9-138
9-141 and 9-142	9-141 and 9-142
---	9-142.1 and 9-142.2
9-143 and 9-144	9-143 blank/9-144
9 153 and 9-154	9-153 and 9-154
9-191 and 9-192	9-191 and 9-192
---	9-192.1 and 9-192.2
9-193 and 9-194	9-193 blank/9-194
9-195 through 9-200	9-195 through 9-200
9-231 and 9-232	9-231 and 9-232
9-275 through 9-278	9-275 through 9-278
9-309 and 9-310	9-309 and 9-310
9-335 through 9-340	9-335 through 9-340
9-357 through 9-362	9-357 through 9 362

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

CHANGE }
No. 6 }

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 4 August 1988

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i/ii	i/ii
9-21 through 9-24	9-21 through 9-24
9-29 through 9-32	9-29 through 9-32
9-38	9-38
9-39 and 9-40	9-39 and 9-40
9-53 and 9-54	9-53 and 9-54
9-71 through 9-80	9-71 through 9-80
9-93 and 9-94	9-93 and 9-94
9-97 and 9-98	9-97 and 9-98
9-98.1/9-98.2	9-98.1/9-98.2
9-99 and 9-100	9-99 and 9-100
9-109 and 9-110	9-109 and 9-110
9-121 and 9-122	9-121 and 9-122
9-169 and 9-170	9-169 and 9-170
9-396 through 9-404	9-396 through 9-404
9-407 and 9-408	9-407 and 9-408

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter.

CHANGE
No. 7

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 17 November 1988

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
9-3 through 9-12	9-3 through 9-12
9-169 and 9-170	9-169 and 9-170
---	9-170.1 and 9-170.2
9-171 and 9-172	9-172
9-173 through 9-180	9-173 through 9-180
9-189 and 9-190	9-189 and 9-190
---	9-190.1/9-190.2
9-191 and 9-192	9-191 and 9-192
9-205 through 9-210	9-205 through 9-210
9-216	9-215 and 9-216
9-223 through 9-228	9-223 through 9-228
9-231 and 9-232	9-231/9-232
---	9-232.1 and 9-232.2
9-233 and 9-234	9-233 and 9-234
9-238	9-237 and 9-238

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM Maintenance requirements for AH-64A Helicopter, Attack (APACHE).

AH-64A EFFECTIVITY CODES

Refer to Volume 1 HOW TO USE THIS VOLUME for an explanation of the AH-64A Helicopter Effectivity codes.

Code	Helicopter Serial No.
AAA	82-23355 through 83-23814.
AAB	83-23815 and subsequent.
AAC	82-23355 through 83-23804.
AAD	83-23805 and subsequent.
AAF	83-23828 through 84-24209.
AAG	84-24212 and subsequent.
AAH	82-23355 through 82-23361.
AAJ	82-23362 through 83-23814.
AAK	82-23362 and subsequent.
AAP	82-23355 through 84-24241.
AAQ	84-24242 and subsequent.
AAT	82-23355 through 82-23364, 83-23787, 83-23789 through 83-23797, 83-23799 through 83-23810, 83-23812 through 83-23814, 83-23816 through 83-23826.
AAU	82-23365, 83-23788, 83-23798, 83-23811, 83-23815, 83-23827 and subsequent.
AAV	82-23355 through 82-23365.
AAW	83-23787 and subsequent.
ABH	82-23355 through 84-24289
ABI	84-24290 and subsequent.

CHAPTER 9. ELECTRICAL SYSTEM

CHAPTER OVERVIEW

Chapter 9 contains the operational check and fault isolation procedures required for troubleshooting the electrical system.

Electrical system maintenance information is in TM 55-1520-238-23.

Chapter 9 is divided into the following sections:

	Para	Title
Section I	9-1-1	Failure Symptom List
Section II consists of the following troubleshooting procedures for AC Electrical Generation:		
	9-2-1	AC Electrical Power Generation - FD/LS Check
	9-2-2	AC Electrical Power Generation - Operational Check
Section III	9-3-1	DC Electrical Power Generation - Operational Check
Section IV	9-4-1	Battery - Operational Check
Section V	9-5-1	External Power and Ground Service Utility Receptical- Operational Check
Section VI	9-6-1	Navigation Lights - Operational Check
Section VII	9-7-1	Formation Lights - Operational Check
Section VIII	9-8-1	Anti-Collision Lights - Operational Check
Section IX	9-9-1	Landing/Search Light - Operational Check
Section X	9-10-1	Maintenance Lights - Operational Check
Section XI	9-11-1	Pilot Utility and Secondary Lights - Operational Check
Section XII	9-12-1	CPG Utility and Secondary Lights - Operational Check
Section XIII	9-13-1	Pilot Edge-Light - Operational Check
Section XIV	9-14-1	CPG Edge-Light - Operational Check
Section XV	9-15-1	Circuit Breaker Reference List
	9-15-2	Pilot Circuit Breaker Panel - Accessing, Securing Procedure
Section XVI	9-16-1	Circuit Protection System (AC Essential Bus 1 - Pilot Station) - Operational Check
Section XVII	9-17-1	Circuit Protection System (AC Essential Bus 1 - CPG Station) - Operational Check
Section XVIII	9-18-1	Circuit Protection System (AC Essential Bus 2 - Pilot Station) - Operational Check
Section XIX	9-19-1	Circuit Protection System (AC Essential Bus 2 - CPG Station) - Operational Check
Section XX	9-20-1	Circuit Protection System (DC Essential Bus 1 - Pilot Station) - Operational Check
Section XXI	9-21-1	Circuit Protection System (DC Essential Bus 1 - CPG Station) - Operational Check
Section XXII	9-22-1	Circuit Protection System (DC Essential Bus 2 - Pilot Station) - Operational Check
Section XXIII	9-23-1	Circuit Protection System (DC Essential Bus 3 - Pilot Station) - Operational Check
Section XXIV	9-24-1	Circuit Protection System (DC Essential Bus 3 - CPG Station) - Operational Check
Section XXV	9-25-1	Circuit Protection System (DC Emergency Bus - Pilot Station) - Operational Check
Section XXVI	9-26-1	Circuit Protection System (DC Emergency Bus - CPG Station) - Operational Check
Section XXVII	9-27-1	Circuit Protection System (DC Ground Circuit Breakers - Pilot Station) - Operational Check
Section XXVIII	9-28-1	Circuit Protection System (DC Ground Circuit Breakers - CPG Station) - Operational Check
Section XXIX	9-29-1	Circuit Breaker Edge-Light Panel - Operational Check
Section XXX	9-30-1	Pilot and CPG Caution/Warning Panels-Indicators Functional Data
Section XXXI	9-31-1	Pilot Caution and Warning System - Operational Check
Section XXXII	9-32-1	CPG Caution and Warning System - Operational Check
Section XXXIII	9-33-1	Audio Warning System - Operational Check

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST

Symptom	Go to Para
A. AC Electrical Power Generation - Operational Check:	
1. GEN 2 indicator is not lighted with generator No. 2 off line.	9-2-2
2. GEN 1 indicator is lighted.	9-2-2
3. GEN 2 indicator is lighted.	9-2-2
4. GEN 1 indicator is not lighted with generator No. 1 off line.	9-2-2
5. ELEC PWR panel edge-light - does not light.	9-2-2
6. With GEN 1 switch in GEN 1 position - GEN 1 indicator is lighted.	9-2-2
7. With GEN 2 switch in GEN 2 position - GEN 2 indicator is lighted.	9-2-2
8. RECT 1 indicator - is lighted with GEN 1 switch OFF.	9-2-2
9. RECT 2 indicator - is lighted with GEN 2 switch OFF and GEN 1 switch at GEN 1.	9-2-2
B. DC Electrical Power Generation - Operational Check:	
1. Power is not available to all DC essential bus No. 1 circuit breakers.	9-3-1
2. Power is not available to all DC essential bus No. 2 circuit breakers.	9-3-1
3. POWER XFMR RECT 1 circuit breaker (CB1) - does not stay closed.	9-3-1
4. POWER XFMR RECT 2 circuit breaker (CB4) - does not stay closed.	9-3-1
5. RECT 1 indicator on pilot caution/warning panel - lights.	9-3-1
6. RECT 2 indicator on pilot caution/warning panel - lights.	9-3-1
7. POWER XFMR RECT 1 and POWER XFMR RECT 2 circuit breakers - do not stay closed.	9-3-1
8. Power is not available to all DC emergency bus circuit breakers.	9-3-1
9. No continuity between W1 and TB1-1-D.	9-3-1
10. DC essential bus No. 1 - has no power.	9-3-1
11. DC essential bus No. 2 - has no power.	9-3-1
12. No continuity between W2 and TB1-1-D.	9-3-1
13. Power is not available to all DC essential bus No. 3 circuit breakers.	9-3-1
14. HOT RECT 1 indicator - is lighted.	9-3-1
15. HOT RECT 2 indicator - is lighted.	9-3-1
16. RECT 1 indicator - is not lighted.	9-3-1
17. RECT 2 indicator - is not lighted.	9-3-1
C. Battery - Operational Check:	
1. Battery - does not come on line.	9-4-1
2. Caution/warning indicators - are illuminated with power off and battery connected.	9-4-1
D. External Power and Ground Service Utility Receptacle - Operational Check:	
1. External power - does not come through external power contactor.	9-5-1
2. GEN 1 contactor - does not close with external power applied.	9-5-1
3. Ground utility service receptacle - does not have AC power.	9-5-1
4. Ground service utility receptacle - does not have DC power.	9-5-1
5. EXT PWR indicator - is not lighted when external power access door is open.	9-5-1
6. EXT PWR indicator - is lighted when external power access door is closed.	9-5-1
7. Electrical power - does not come on after EXT PWR RESET button has been depressed.	9-5-1
E. Navigation Lights - Operational Check:	
1. All navigation lights - do not function.	9-6-1
2. LT NAV circuit breaker (CB73) - does not stay closed.	9-6-1
3. Left navigation light - does not function.	9-6-1
4. Right navigation light - does not function.	9-6-1
5. Tail navigation light - does not function.	9-6-1
F. Formation Lights - Operational Check:	
1. LT FORM circuit breaker (CB90) - does not stay closed.	9-7-1
2. All formation lights - do not function.	9-7-1
3. Left wing formation light - does not function.	9-7-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
F. Formation Lights - Operational Check (cont):	
4. Right wing formation light - does not function.	9-7-1
5. Tail formation light - does not function.	9-7-1
6. Fuselage formation light - does not function.	9-7-1
G. Anti-Collision Lights - Operational Check:	
1. Red anti-collision lights - do not function.	9-8-1
2. White anti-collision lights - do not function.	9-8-1
3. LT ANTI COL circuit breaker (CB40) - does not stay closed.	9-8-1
4. LT NAV circuit breaker (CB73) - does not stay closed.	9-8-1
5. Left wing red anti-collision light - does not function.	9-8-1
6. Right wing red anti-collision light - does not function.	9-8-1
7. Left wing white anti-collision light - does not function.	9-8-1
8. Right wing white anti-collision light - does not function.	9-8-1
H. Landing/Search Light - Operational Check:	
1. LT SRCH/LDG circuit breaker (CB22) - does not stay closed.	9-9-1
2. LT SRCH/LDG CONTR circuit breaker (CB80) - does not stay closed.	9-9-1
3. Pilot collective stick - does not extend landing/search light.	9-9-1
4. Pilot collective stick - does not rotate landing/search light to the left.	9-9-1
5. Pilot collective stick - does not activate landing/search light.	9-9-1
6. Pilot collective stick - does not rotate landing/search light to the right.	9-9-1
7. Pilot collective stick - does not retract landing/search light.	9-9-1
8. Pilot collective stick - does not stow landing/search light.	9-9-1
9. Pilot collective stick edge-light - is not lighted.	9-9-1
10. CPG collective stick - does not extend landing/search light.	9-9-1
11. CPG collective stick - does not rotate landing/search light to left.	9-9-1
12. CPG collective stick - does not rotate landing/search light to right.	9-9-1
13. CPG collective stick - does not activate landing/search light.	9-9-1
14. CPG collective stick - does not retract landing/search light.	9-9-1
15. CPG collective stick - does not stow landing/search light.	9-9-1
16. CPG collective stick edge-light - is not lighted.	9-9-1
I. Maintenance Lights - Operational Check:	
1. MAINT LT circuit breaker (CB8) - does not stay closed.	9-10-1
2. Maintenance light - does not operate in aft avionics bay.	9-10-1
3. Maintenance light - does not operate in right forward avionics bay.	9-10-1
J. Pilot Utility and Secondary Lights - Operational Check:	
1. LT UTIL SEC circuit breaker (CB23) - does not stay closed.	9-11-1
2. One or more pilot secondary lights - do not light.	9-11-1
3. Pilot utility light - does not light.	9-11-1
K. CPG Utility and Secondary Lights - Operational Check:	
1. EMERG BATT UTIL SEC LT circuit breaker (CB30) - does not stay closed.	9-12-1
2. One or more CPG secondary lights - do not light.	9-12-1
3. CPG utility light - does not light.	9-12-1
L. Pilot Edge-Light - Operational Check:	
1. Pilot LT PRI circuit breaker (CB39) - does not stay closed.	9-13-1
2. All pilot left console edge-lighted panels - do not light.	9-13-1
3. All pilot right and center console edge-lighted panels - do not light.	9-13-1
4. All pilot instrument edge-lighted panels - do not light.	9-13-1
5. All Ch. 1 No. 1 edge-lighted panels - do not light.	9-13-1
6. All Ch. 1 No. 2 edge-light panels - do not light.	9-13-1
7. All Ch. 2 No. 1 edge-light panels - do not light.	9-13-1
8. All Ch. 2 No. 2 edge-light panels - do not light.	9-13-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
L. Pilot Edge-Light - Operational Check (cont):	
9. All Ch. 2 No. 3 edge-light panels - do not light.	9-13-1
10. All Ch. 3 No. 1 edge-light panels - do not light.	9-13-1
11. All Ch. 3 No. 2 edge-light panels - do not light.	9-13-1
12. All Ch. 3 No. 3 edge-light panels - do not light.	9-13-1
13. All Ch. 4 No. 1 edge-light panels - do not light.	9-13-1
14. All Ch. 4 No. 2 edge-light panels - do not light.	9-13-1
15. All Ch. 4 No. 4 edge-light panels - do not light.	9-13-1
16. **EXT LT/INTR LT** edge-light - does not light.	9-13-1
M. CPG Edge-Light - Operational Check:	
1. **CPG PRI LT** circuit breaker (CB14) - does not stay closed.	9-14-1
2. All CPG left console edge-lighted panels - do not light.	9-14-1
3. All CPG right console edge-lighted panels - do not light.	9-14-1
4. All CPG instrument edge-lighted panels - do not light.	9-14-1
5. All Ch. 1 No. 1 edge-light panels - do not light.	9-14-1
6. All Ch. 1 No. 2 edge-light panels - do not light.	9-14-1
7. All Ch. 2 No. 1 edge-light panels - do not light.	9-14-1
8. All Ch. 3 No. 1 edge-light panels - do not light.	9-14-1
9. All Ch. 3 No. 2 edge-light panels - do not light.	9-14-1
10. All Ch. 4 No. 1 edge-light panels - do not light.	9-14-1
11. All Ch. 4 No. 2 edge-light panels - do not light.	9-14-1
12. All Ch. 4 No. 3 edge-light panels - do not light.	9-14-1
13. **CPG INTR LT** panel edge-light - does not light.	9-14-1
N. Circuit Breaker Reference List.	9-15-1

Symptom	Go to Para
O. Circuit Protection System (AC Essential Bus 1-Pilot Station) - Operational Check:	
1. A short exists between ground and A76P3-G, -H, -J; A76P3-K, -L, -M; or A76P3-N, -P, -R.	9-16-1
2. **MISSION PNVS AC** circuit breaker (CB81) - does not stay closed or 115 VAC to PNVS is not present at A76P2-N, -P, -R.	9-16-1
3. **MISSION IHADSS** circuit breaker (CB41) - does not stay closed or 115 VAC to IHADSS is not present at A76P1-11, -12, -13.	9-16-1
4. **MISSION RDR JAM AC** circuit breaker (CB74) - does not stay closed or 115 VAC to radar jammer is not present at A76P1-5, -6, -7.	9-16-1
5. **NAV AIR DATA AC** circuit breaker (CB84) - does not stay closed or 115 VAC to OAS is not present at A76P2-H, -G, -F.	9-16-1
6. **NAV HARS AC** circuit breaker (CB42) - does not stay closed or 115 VAC to HARS is not present at A76P1-38, -39, -40.	9-16-1
7. **MISSION SYM GEN** circuit breaker (CB45) - does not stay closed or 115 VAC to symbol generator is not present at A76P1-52.	9-16-1
8. **LT PRI** circuit breaker (CB39) - does not stay closed or 115 VAC to multi-channel dimming controller is not present at A76P1-45.	9-16-1
9. **LT ANTI COL** circuit breaker (CB40) - does not stay closed or 115 VAC to anti-collision lights is not present at A76P1-44.	9-16-1
10. **LT FORM** circuit breaker (CB90) - does not stay closed or 115 VAC to formation lights is not present at A76P1-24.	9-16-1
11. **NAV HSI** circuit breaker (CB43) - does not stay closed or 115 VAC to horizontal situation indicator is not present at A76P1-26.	9-16-1
12. **ASE AC** circuit breaker (CB18) - does not stay closed or 115 VAC to ASE actuators is not present at A76P1-54.	9-16-1
13. **MISSION EL AC** circuit breaker (CB92) - does not stay closed or 115 VAC to stores elevation controller is not present at A76P1-30.	9-16-1
14. **MISSION FC AC** circuit breaker (CB51) - does not stay closed or 115 VAC to power supply is not present at A76P1-28.	9-16-1
15. **ECS L NOSE GRBX HTR** circuit breaker (CB38) - does not stay closed or 115 VAC is not present at A76P2-m, -n, -p.	9-16-1
16. **ECS R NOSE GRBX HTR** circuit breaker (CB211) - does not stay closed or 115 VAC is not present at A76P2-q, -r, -s.	9-16-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
O. Circuit Protection System (AC Essential Bus 1 Pilot Station) - Operational Check (cont):	
17. **POWER XFMR RECT 1** circuit breaker (CB1) - does not stay closed or continuity to XFMR RECT No. 1 does not exist between A76P3-K and -S, -L and -T, -M and -U.	9-16-1
18. **POWER ENG 1** circuit breaker (CB62) - does not stay closed or 115 VAC to engine 1 power transformer is not present at P76P1-22.	9-16-1
19. **STAB AUTO AC** circuit breaker (CB2) - does not stay closed or 115 VAC to stabilator control unit is not present at P76P1-36.	9-16-1
20. **STAB MAN AC** circuit breaker (CB7) - does not stay closed or 115 VAC to stabilator position indicator is not present at P76P1-37.	9-16-1
P. Circuit Protection System (AC Essential Bus 1 CPG Station) - Operational Check:	
1. Short exists between ground and P461-D, -E or -F.	9-17-1
2. 115 VAC - is not present at P767-30, -31.	9-17-1
3. Short exists between ground and P461-L.	9-17-1
4. **AWS AWS AC** circuit breaker (CB11) - does not stay closed or continuity to gun and turret control boxes does not exist between A77J4-L and A77J2-12, -19.	9-17-1
5. **MSL R OUTBD LCHR AC** circuit breaker (CB18) - does not stay closed or continuity to missile launcher 4 does not exist between A77J2-5 and -31.	9-17-1
6. **MSL R INBD LCHR AC** circuit breaker (CB21) - does not stay closed or continuity to missile launcher 3 does not exist between A77J2-31 and -4.	9-17-1
7. **MSL L INBD LCHR AC** circuit breaker (CB24) - does not stay closed or continuity to missile launcher 2 does not exist between A77J2-31 and -3.	9-17-1
8. **MSL L OUTBD LCHR AC** circuit breaker (CB26) - does not stay closed or continuity to missile launcher 1 does not exist between A77J2-31 and -2.	9-17-1
9. **FC FCC AC** circuit breaker (CB16) - does not stay closed or continuity to fire control panel does not exist between A77J2-30 and -35.	9-17-1
10. **ATTD IND** circuit breaker (CB20) - does not stay closed or continuity to remote attitude indicator does not exist between A77J2-30 and A77J1-6.	9-17-1
11. **LASER** circuit breaker (CB4) - does not stay closed or 115 VAC to laser electronic unit is not present at A97J1-A, -B, -D.	9-17-1
12. **TADS AC** circuit breaker (CB3) - does not stay closed or 115 VAC to TADS power supply and ORT is not present at A97J1-H, -F, -E.	9-17-1
13. **IHADSS** circuit breaker (CB1) - does not stay closed or 115 VAC to IHADSS SEU is not present at A97P1-E, -D, -C.	9-17-1
Q. Circuit Protection System (AC Essential Bus 2 Pilot Station) - Operational Check:	
1. A short exists between ground and A76P3-D, -E, -F or A76P4-A, -B, -C.	9-18-1
2. **POWER XFMR RECT 2** circuit breaker (CB4) - does not stay closed or continuity to XFMR RECT No. 2 does not exist between P4-A and -D, -B and -E, -C and -F.	9-18-1
3. **ECS CANOPY ANTI ICE** circuit breaker (CB78) - does not stay closed or 115 VAC to canopy temperature control is not present at P2-c, -d, -e.	9-18-1
4. **ECS AFT FAN** circuit breaker (CB75) - does not stay closed or 115 VAC to electrical power center and aft avionics fans is not present at P2-A, -B, -C.	9-18-1
5. **ECS ICE DET HTR** circuit breaker (CB212) - does not stay closed or 115 VAC is not present at A76P1-9.	9-18-1
6. **ECS FAB FAN** circuit breaker (CB88) - does not stay closed or 115 VAC to FAB fan relays is not present at P2-K, -L, -M.	9-18-1
7. **POWER ENG 2** circuit breaker (CB44) - does not stay closed or 115 VAC to engine No. 2 power transformer is not present at P1-23.	9-18-1
8. **POWER BATT CHGR AC** circuit breaker (CB86) - does not stay closed or 115 VAC to battery charger and heater is not present at P1-35.	9-18-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
R. Circuit Protection System (AC Essential Bus 2 - CPG Station) - Operational Check:	
1. 115 VAC - is not present at P769-H, -B, -E.	9-19-1
2. **AWS MTR** circuit breaker (CB3) - does not stay closed or continuity to gun control box does not exist between J4-H and J3-4, J4-B and J3-5, J4-E and J3-6.	9-19-1
3. **AWS AMMO** circuit breaker (CB7) - does not stay closed or continuity to downloader and rounds counter does not exist between J4-H and J2-1, J4-B and J2-15, J4-E and J2-22.	9-19-1
4. **FC RC DR** circuit breaker (CB8) - does not stay closed or continuity to video recorder does not exist between J4-E and J2-16.	9-19-1
5. **PRI LT** circuit breaker (CB14) - does not stay closed or continuity to multi-channel dimming controller does not exist between J4-H and J1-9.	9-19-1
S. Circuit Protection System (DC Essential Bus 1 - Pilot Station) - Operational Check:	
1. A short exists between ground and A76P4-M or -N.	9-20-1
2. **STAB MAN DC** circuit breaker (CB6) - does not stay closed or 28 VDC to stabilator relay panel is not present at A76P2-g.	9-20-1
3. **ECS CANOPY ANTI ICE CONTR** circuit breaker (CB70) - does not stay closed or 28 VDC to **ANTI ICE** panel is not present at A76P1-3.	9-20-1
4. **ECS WSHLD WPR** circuit breaker (CB71) - does not stay closed or 28 VDC to windshield wiper motors is not present at A76P2-b.	9-20-1
5. **ECS ENG ANTI ICE** circuit breaker (CB67) - does not stay closed or 28 VDC to **ANTI ICE** panel is not present at A76P1-4.	9-20-1
6. **POWER BATT CHGR DC** circuit breaker (CB5) - does not stay closed or 28 VDC to battery charger is not present at A76P2-a.	9-20-1
7. Pilot **CBR BLWR** circuit breaker (CB94) - does not stay closed or 28 VDC is not present between P993-A and P993-B.	9-20-1
T. Circuit Protection System (DC Essential Bus 1 - CPG Station) - Operational Check:	
1. 28 VDC is not present at P763-D.	9-21-1
2. **TADS DC** circuit breaker (CB2) - does not stay closed or 28 VDC to TADS/ PNVS turret is not present at A97J1-M, -L, -G, -C.	9-21-1
3. CPG **CBR BLWR** circuit breaker (CB5) - does not stay closed or 28 VDC is not present between P997-A and P997-B.	9-21-1
U. Circuit Protection System (DC Essential Bus 2 - Pilot Station) - Operational Check:	
1. A short exists between ground and A76P4-J or G.	9-22-1
2. **MISSION ARM CONTR** circuit breaker (CB46) - does not stay closed or 28 VDC to ground maintenance switch is not present at P2-E.	9-22-1
3. **IR JAM XMTR** circuit breaker (CB66) - does not stay closed or 28 VDC to IR jammer control is not present at A76P2-h.	9-22-1
4. **MISSION PEN AIDS CONTR** circuit breaker (CB49) - does not stay closed or 28 VDC to radar and IR jammer controls is not present at P1-49.	9-22-1
5. **MISSION EL DC** circuit breaker (CB93) - does not stay closed or 28 VDC to external stores elevation panel is not present at P1-29.	9-22-1
6. **MISSION JETT** circuit breaker (CB89) - does not stay closed or 28 VDC to **STORES JETT** panel is not present at P1-18.	9-22-1
7. **NAV VDU** circuit breaker (CB91) - does not stay closed or 28 VDC to video display unit is not present at P1-41, -42	9-22-1
8. **FUEL TRANS** circuit breaker (CB56) - does not stay closed or 28 VDC to pilot **FUEL** panel is not present at P2-D.	9-22-1
9. **FUEL BST** circuit breaker (CB57) - does not stay closed or 28 VDC to fuel pressure switch is not present at P1-31, -48.	9-22-1
10. **TWHL LOCK** circuit breaker (CB59) - does not stay closed or 28 VDC to **TAIL WHEEL** lock panel is not present at P1-15.	9-22-1
11. **LT NAV** circuit breaker (CB73) - does not stay closed or 28 VDC to navigation lights is not present at P1-25.	9-22-1
12. **VIB MON** circuit breaker (CB79) - does not stay closed or 28 VDC to rotor balance signal processor is not present at P1-10.	9-22-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
V. Circuit Protection System (DC Essential Bus 3-Pilot Station) - Operational Check:	
1. A short exists between ground and A76P4-L or -K.	9-23-1
2. **MISSION PNVS DC** circuit breaker (CB61) - does not stay closed or 28 VDC to PNVS electronic unit is not present at P2-k.	9-23-1
3. **NAV HARS DC** circuit breaker (CB54) - does not stay closed or 28 VDC to HARS is not present at P1-46.	9-23-1
4. **NAV DPLR** circuit breaker (CB82) - does not stay closed or 28 VDC to doppler signal data comparator is not present at P1-51.	9-23-1
5. **NAV AIR DATA DC** circuit breaker (CB69) - does not stay closed or 28 VDC to air data processor is not present at P2-J.	9-23-1
6. **MISSION FC DC** circuit breaker (CB50) - does not stay closed or 28 VDC to pilot **FIRE CONTROL** panel is not present at P1-17.	9-23-1
7. **MISSION RKT ELEX** circuit breaker (CB47) - does not stay closed or 28 VDC to CPG **FIRE CONTROL** panel is not present at P1-27.	9-23-1
8. **ASE DC** circuit breaker (CB28) - does not stay closed or 28 VDC to ASE panel is not present at P1-34.	9-23-1
9. **ECS ICE DET** circuit breaker (CB68) - does not stay closed or 28 VDC to ice detector signal processor is not present at P1-47.	9-23-1
10. **ECS BLADE DEICE CONTR** circuit breaker (CB83) does not stay closed or 28 VDC to rotor blade deice controller is not present at P1-14.	9-23-1
11. **ECS BLADE DEICE** circuit breaker (CB85) - does not stay closed or 28 VDC to blade deice contactor is not present at P1-53.	9-23-1
12. **STAB AUTO DC** circuit breaker (CB3) - does not stay closed or 28 VDC to stabilator control unit is not present at P2-f.	9-23-1
W. Circuit Protection System (DC Essential Bus 3-CPG Station) - Operational Check:	
1. 28 VDC - is not present at P769-A, -J.	9-24-1
2. **FC FCC DC** circuit breaker (CB4) - does not stay closed or continuity to fire control computer does not exist between J4-J and J2-32.	9-24-1
3. **AWS AWS DC** circuit breaker (CB12) - does not stay closed or continuity to gun and turret control boxes does not exist between J4-J and J2-24, -33.	9-24-1
4. **MSL DC ELEC** circuit breaker (CB17) - does not stay closed or continuity to remote hellfire electronics unit does not exist between J4-J and J2-20, -21.	9-24-1
5. **MUX CPG** circuit breaker (CB15) - does not stay closed or continuity to CPG MRTU type III does not exist between J4-A and J2-7.	9-24-1
6. **MUX L PYL OUTBD** circuit breaker (CB2) - does not stay closed or continuity to pylon MRTU type II does not exist between J4-A and J2-11.	9-24-1
7. **MUX L PYL INBD** circuit breaker (CB1) - does not stay closed or continuity to pylon MRTU type II does not exist between J4-A and J2-9.	9-24-1
8. **MUX R PYL INBD** circuit breaker (CB5) - does not stay closed or continuity to pylon MRTU type II does not exist between J4-A and J2-8.	9-24-1
9. **MUX R PYL OUTBD** circuit breaker (CB6) - does not stay closed or continuity to pylon MRTU type II does not exist between J4-A and J2-10.	9-24-1
10. **MUX FAB L** circuit breaker (CB10) - does not stay closed or continuity to left FAB MRTU type I does not exist between J4-A and J2-14.	9-24-1
11. **MUX FAB R** circuit breaker (CB9) - does not stay closed or continuity to right FAB MRTU type I does not exist between J4-A and J2-13.	9-24-1
X. Circuit Protection System (DC Emergency Bus-Pilot Station) - Operational Check:	
1. Short exists between ground and A76P5-1, -2, -3.	9-25-1
2. Continuity - does not exist between A76P5-2 and A76P5-1, -3.	9-25-1
3. **LT SRCH/LDG** circuit breaker (CB22) - does not stay closed or continuity to search light relay does not exist between A76P5-2 and -4.	9-25-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
X. Circuit Protection System (DC Emergency Bus - Pilot Station) - Operational Check (cont):	
4. **APU HOLD** circuit breaker (CB10) - does not stay closed or continuity to **BTL DISCHARGE/APU** panel does not exist between A76J1-h and -B.	9-25-1
5. **FUEL FILL** circuit breaker (CB32) - does not stay closed or continuity to refuel panel does not exist between A76J1-h and -A.	9-25-1
6. **JETT** circuit breaker (CB34) - does not stay closed or 28 VDC to pilot and CPG collective stick ST JETT switch is not present at A76J1-P, -R.	9-25-1
7. **ENG WARN** circuit breaker (CB52) - does not stay closed or 28 VDC to engine out warning unit is not present at A76J1-N.	9-25-1
8. **FUEL APU** circuit breaker (CB9) - does not stay closed or 28 VDC to ground service utility receptacle is not present at A76J1-z.	9-25-1
9. **FUEL VLV ACTR** circuit breaker (CB14) - does not stay closed or 28 VDC to pilot fire extinguish panel is not present at A76J1-C.	9-25-1
10. **FIRE EXTGH APU** circuit breaker (CB26) - does not stay closed or 28 VDC to **BTL DISCHARGE/APU** panel is not present at A76J1-J.	9-25-1
11. **FIRE EXTGH CPG** circuit breaker (CB15) - does not stay closed or 28 VDC to CPG fire extinguish panel is not present at A76J1-H.	9-25-1
12. **FIRE EXTGH PLT** circuit breaker (CB25) - does not stay closed or 28 VDC to pilot fire extinguish panel is not present at A76J1-D.	9-25-1
13. **FIRE DETR APU** circuit breaker (CB11) - does not stay closed or 28 VDC to APU flame detector is not present at A76J1-E.	9-25-1
14. **FIRE DETR ENG 2** circuit breaker (CB13) - does not stay closed or 28 VDC to engine 2 flame detector is not present at A76J1-G.	9-25-1
15. **FIRE DETR ENG 1** circuit breaker (CB12) does not stay closed or 28 VDC to engine 1 flame detector is not present at A76J1-F.	9-25-1
16. **ENG INST** circuit breaker (CB17) - does not stay closed or 28 VDC to signal data converter is not present at A76J1-L, -M.	9-25-1
17. **ENG START** circuit breaker (CB58) - does not stay closed or 28 VDC to pilot power quadrant is not present at A76J1-c, -X.	9-25-1
18. **ENG LVR** circuit breaker (CB16) - does not stay closed or 28 VDC to pilot fire extinguish panel is not present at A76J1-K.	9-25-1
19. **ENG CUT** circuit breaker (CB60) - does not stay closed or 28 VDC to pilot and CPG collective sticks is not present at A76J1-b.	9-25-1
20. **THROT** circuit breaker (CB8) - does not stay closed or 28 VDC to CPG power quadrant panel is not present at A76J1-d.	9-25-1
21. **STBY ATTD** circuit breaker (CB19) - does not stay closed or 28 VDC to standby attitude indicator is not present at A76J1-e.	9-25-1
22. **RDR ALT** circuit breaker (CB31) - does not stay closed or 28 VDC to radar altimeter receiver and transmitter is not present at A76J1-f, -g.	9-25-1
23. **TRIM** circuit breaker (CB87) - does not stay closed or 28 VDC to pilot and CPG cyclic sticks is not present at A76J1-Y, -Z.	9-25-1
24. **EMERG HYD** circuit breaker (CB35) - does not stay closed or 28 VDC to primary and utility hydraulic manifolds is not present at A76J1-k, -m.	9-25-1
25. **LT UTIL SEC** circuit breaker (CB23) - does not stay closed or 28 VDC to utility lights is not present at A76J1-U, -W.	9-25-1
26. **LT SRCH/LDG CONT** circuit breaker (CB80) - does not stay closed or 28 VDC to pilot and CPG collective sticks - search light control is not present at A76J1-V.	9-25-1
27. **LT CAUT** circuit breaker (CB21) - does not stay closed or 28 VDC to pilot master and caution/warning panels is not present at A76J1-y.	9-25-1
28. **CHAFF** circuit breaker (CB48) - does not stay closed or 28 VDC to chaff dispense control is not present at A76J1-t.	9-25-1
29. **RTR BRK** circuit breaker (CB37) - does not stay closed or 28 VDC to rotor brake pressure switch is not present at A76J1-n.	9-25-1
30. **RDR WARN** circuit breaker (CB53) - does not stay closed or 28 VDC to radar warning detecting set control is not present at A76J1-q.	9-25-1
31. **PITOT HTR** circuit breaker (CB36) - does not stay closed or 28 VDC to pilot **ANTI-ICE** panel is not present at A76J1-s.	9-25-1
32. **COMM ICS** circuit breaker (CB27) - does not stay closed or 28 VDC to audio junction unit is not present at A76J1-a.	9-25-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
X. Circuit Protection System (DC Emergency Bus - Pilot Station) - Operational Check (cont):	
33. **COMM VHF FM** circuit breaker (CB64) - does not stay closed or 28 VDC to phase front homing module is not present at A76J1-w.	9-25-1
34. **COMM KY 28** circuit breaker (CB30) - does not stay closed or 28 VDC to secure voice control panel is not present at A76J1-p.	9-25-1
35. **COMM UHF AM** circuit breaker (CB24) - does not stay closed or 28 VDC to UHF - AM radio control panel is not present at A76J1-v.	9-25-1
36. **COMM IFF** circuit breaker (CB29) - does not stay closed or 28 VDC to IFF receiver transmitter is not present at A76J1-S.	9-25-1
37. **COMM ADF** circuit breaker (CB65) - does not stay closed or 28 VDC to direction finder receiver is not present at A76J1-r.	9-25-1
38. **ECS CAB** circuit breaker (CB76) - does not stay closed or 28 VDC to **AUX** panel is not present at A76P1-2.	9-25-1
39. **FUEL XFEED** circuit breaker (CB55) - does not stay closed or 28 VDC to engine 1 and 2 fuel valve actuators is not present at P1-32.	9-25-1
Y. Circuit Protection System (DC Emergency Bus - CPG Station) - Operational Check:	
1. **EMERG BATT ICS** circuit breaker (CB13) - does not stay closed or continuity to audio junction unit does not exist between J4-C and J1-5.	9-26-1
2. Continuity - does not exist between A77J4-C and CB29-1 or 28 VDC is not present at P769-C.	9-26-1
3. **EMERG BATT VHF AM/FM** circuit breaker (CB32) - does not stay closed or continuity to radio control panel does not exist between J4-C and J1-7.	9-26-1
4. **EMERG BATT ENG INST** circuit breaker (CB31) - does not stay closed or continuity to signal data converter does not exist between J4-C and J1-8, -10.	9-26-1
5. **EMERG BATT UTIL SEC LT** circuit breaker (CB30) - does not stay closed or continuity to CPG interior light panels does not exist between J4-C and J1-2, -3.	9-26-1
6. **EMERG BATT CAUT** circuit breaker (CB29) - does not stay closed or continuity to master and caution/warning panels does not exist between J4-C and J1-4.	9-26-1
Z. Circuit Protection System (DC Ground Circuit Breakers-Pilot Station) - Operational Check:	
1. Open exists between A76P1-50 and -16 or a short exists between ground and A76P1-16.	9-27-1
2. Open exists between A76P1-1 and -8 or a short exists between ground and A76P1-1.	9-27-1
3. Open exists between A402J1-8 and -16.	9-27-1
AA. Circuit Protection System (DC Ground Circuit Breakers - CPG Station) - Operational Check:	
1. Short exists - between ground and A77J2-39.	9-28-1
2. Continuity between A77J2-39 and -6 - does not exist or a short to launcher seeker No. 2 exists between ground and A77J2-6.	9-28-1
3. Continuity between A77J2-39 and -17 - does not exist or a short to launcher seeker No. 1 exists between ground and A77J2-17.	9-28-1
4. Continuity between A77J2-39 and -23 - does not exist or a short to ejector RCCB exists between ground and A77J2-23.	9-28-1
5. Continuity between A77J2-39 and -25 - does not exist or short to launcher seeker No. 3 exists between ground and A77J2-25.	9-28-1
6. Continuity between A77J2-39 and -18 - does not exist or short to launcher seeker No. 4 exists between ground and A77J2-18.	9-28-1
AB. Circuit breaker Edge-Light Panel - Operational Check:	
1. Pilot circuit breaker edge-light panels - do not function.	9-29-1
2. CPG circuit breaker panel No. 1 edge-light - does not light.	9-29-1
3. CPG circuit breaker panel No. 2 edge-light - does not light.	9-29-1
AC. Pilot and CPG Caution/Warning Panels - Indicators Functional Data.	9-30-1
AD. Pilot Caution and Warning System - Operational Check:	
1. **LT CAUT** circuit breaker (CB21) - does not stay closed.	9-31-1
2. **PRESS TO TEST** indicator - is not lighted.	9-31-1

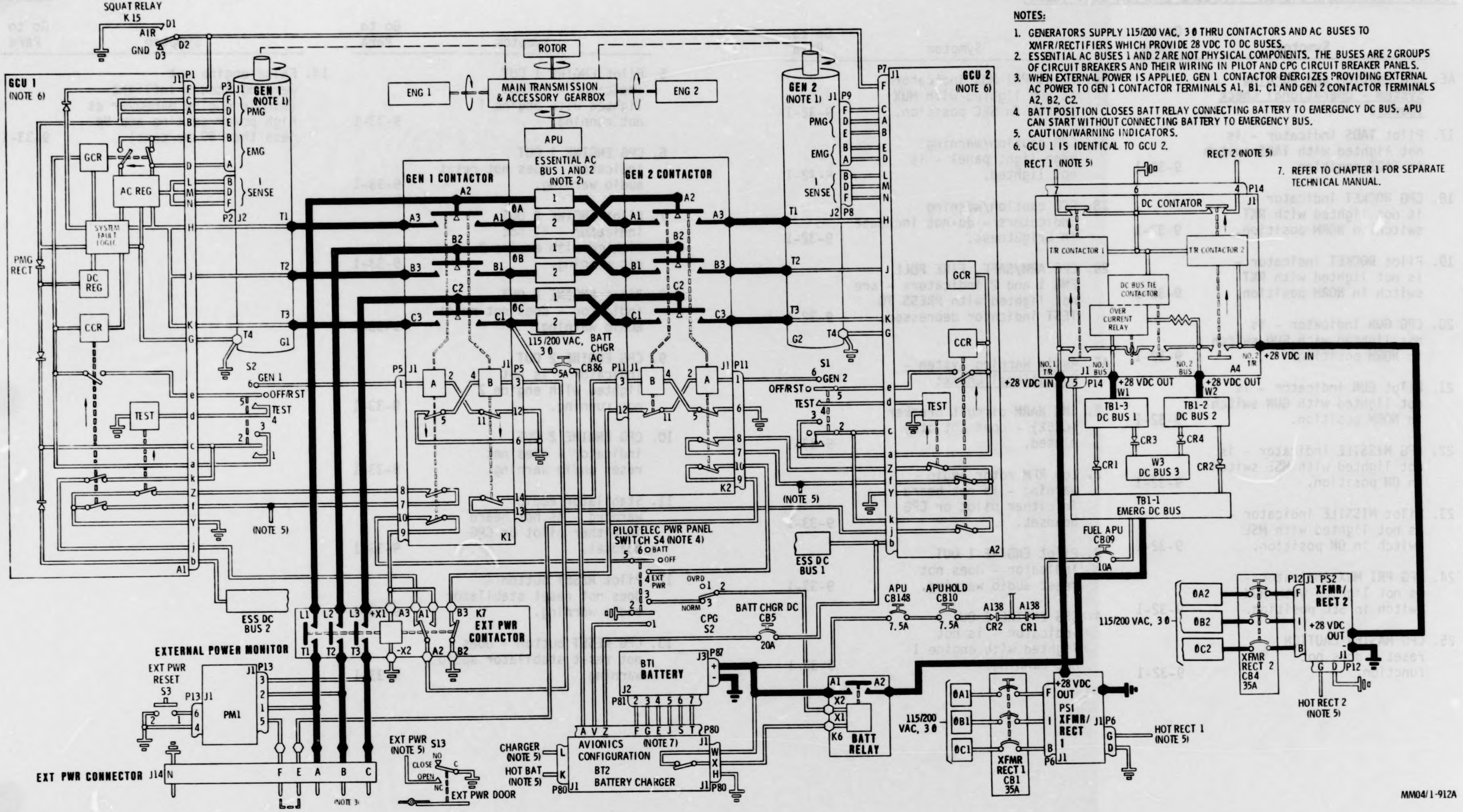
9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
AD. Pilot Caution and Warning System - Operational Check (cont):	
3. Master caution/warning and caution/warning panels - are not lighted with PRESS TO TEST indicator depressed.	9-31-1
4. MASTER CAUTION indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
5. LOW RPM ROTOR indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
6. FIRE APU indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
7. ENGINE 1 OUT indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
8. ENGINE CHOP indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
9. ENGINE 2 OUT indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
10. HIGH RPM ROTOR indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
11. BUCS FAIL indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
12. PRI DISCH indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
13. RES DISCH indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
14. ENG 1 indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
15. ENG 2 indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
16. BLADE ON indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
17. ENG 1 indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
18. ENG 2 indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
19. EMERG PWR indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
20. ROCKETS panel indicators - are not lighted with PRESS TO TEST indicator depressed.	9-31-1
21. TAIL WHEEL indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
22. ARM/SAFE indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
23. FIRE PULL ENG 1 switch - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
24. FIRE PULL ENG 2 switch - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
25. MA indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
26. Radar warning control panel SELF TEST indicator - is not lighted with PRESS TO TEST indicator depressed.	9-31-1
27. Remote transmit select indicator(s) - are not lighted with PRESS TO TEST indicator depressed.	9-31-1
28. MASTER CAUTION indicator - does not reset caution indicators.	9-31-1
29. APU FIRE PULL HANDLE - does not light with PRESS TO TEST indicator depressed.	9-31-1
AE. CPG Caution and Warning System - Operational Check:	
1. EMERG BATT CAUT circuit breaker (CB29) - does not stay closed.	9-32-1
2. PRESS TO TEST indicator - is not lighted.	9-32-1
3. All caution/warning master caution and indicators - do not light with PRESS TO TEST indicator depressed.	9-32-1
4. MASTER CAUTION indicator - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
5. LOW RPM ROTOR indicator - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
6. FIRE APU indicator - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
7. ENGINE 1 OUT indicator - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
8. ENGINE CHOP indicator - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
9. ENGINE 2 OUT indicator - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
10. HIGH RPM ROTOR - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
11. BUCS FAIL indicator - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
12. ARM/SAFE advisory light - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
13. FIRE PULL ENG 1 switch - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
14. FIRE PULL ENG 2 switch - is not lighted with PRESS TO TEST indicator depressed.	9-32-1
15. Pilot and CPG ADS indicators - are not lighted with CPG FCC MUX ON.	9-32-1
16. CPG TADS indicator - is not lighted with TADS switch in TADS position.	9-32-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
AE. CPG Caution and Warning System - Operational Check (cont):	
17. Pilot **TADS** indicator - is not lighted with **TADS** switch in **TADS** position.	9-32-1
18. CPG **ROCKET** indicator - is not lighted with **RKT** switch in **NORM** position.	9-32-1
19. Pilot **ROCKET** indicator - is not lighted with **RKT** switch in **NORM** position.	9-32-1
20. CPG **GUN** indicator - is not lighted with **GUN** switch in **NORM** position.	9-32-1
21. Pilot **GUN** indicator - is not lighted with **GUN** switch in **NORM** position.	9-32-1
22. CPG **MISSILE** indicator - is not lighted with **MSL** switch in **ON** position.	9-32-1
23. Pilot **MISSILE** indicator - is not lighted with **MSL** switch in **ON** position.	9-32-1
24. CPG **PRI MUX** indicator - is not lighted with **MUX** switch in **SEC** position.	9-32-1
25. CPG **MASTER CAUTION** reset - does not function.	9-32-1
26. Pilot **PRI MUX** indicator - is not lighted with **MUX** switch in **SEC** position.	9-32-1
27. CPG caution/warning edge-light panel - is not lighted.	9-32-1
28. CPG caution/warning indicators - do not increase in brightness.	9-32-1
29. CPG **ARM/SAFE, FIRE PULL ENG 1** and **2** indicators - are not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
AF. Audio Warning System - Operational Check:	
1. **ENG WARN** circuit breaker (CB52) - does not stay closed.	9-33-1
2. Low RPM rotor audio warning - is not heard in either pilot or CPG headset.	9-33-1
3. Pilot **ENGINE 1 OUT** indicator - does not reset audio warning.	9-33-1
4. CPG **ENGINE 1 OUT** indicator - is not lighted with engine 1 not running.	9-33-1
5. Pilot **ENGINE 1 OUT** indicator - is not lighted with engine 1 not running.	9-33-1
6. CPG **ENGINE 1 OUT** indicator - does not reset audio warning.	9-33-1
7. Pilot **ENGINE 2 OUT** indicator - is not lighted with engine 2 not running.	9-33-1
8. Pilot **ENGINE 2 OUT** indicator - does not reset audio warning.	9-33-1
9. CPG **ENGINE 2 OUT** indicator - is not lighted with engine 2 not running.	9-33-1
10. CPG **ENGINE 2 OUT** indicator - does not reset audio warning.	9-33-1
11. Stabilator audio warning - is not heard in either pilot or CPG headset.	9-33-1
12. Pilot **RESET** button - does not reset stabilator audio warning.	9-33-1
13. CPG **RESET** button - does not reset stabilator audio warning.	9-33-1
14. False engine out warning occurs inflight (single engine maneuver at high power setting and Np less than 89 percent).	9-33-1

9-1-2. ELECTRICAL POWER GENERATION - SYSTEM DIAGRAM


SQUAT RELAY K15
AIR
GND
GCU 1 (NOTE 6)
GCR
AC REG
SYSTEM FAULT LOGIC
PMG RECT
DC REG
CCR
TEST
GEN 1 (NOTE 1)
PMG
EMG
SENSE
ROTOR
MAIN TRANSMISSION & ACCESSORY GEARBOX
ENG 1
ENG 2
APU
ESSENTIAL AC BUS 1 AND 2 (NOTE 2)
GEN 1 CONTACTOR
GEN 2 CONTACTOR
115/200 VAC, 3 0
BATT CHGR AC CB86
GEN 2 (NOTE 1)
GCU 2 (NOTE 6)
S1
GEN 2
OFF/RST
TEST
S2
GEN 1
OFF/RST
TEST
K1
K2
(NOTE 5)
PILOT ELEC PWR PANEL SWITCH S4 (NOTE 4)
BATT
OFF
EXT PWR
OVRD
NORM
CPG S2
ESS DC BUS 1
ESS DC BUS 2
K7 EXT PWR CONTACTOR
EXTERNAL POWER MONITOR
EXT PWR RESET S3
PM1
BT1 BATTERY
BATT CHGR DC CB5 20A
APU CB148 7.5A
APU HOLD CB10 7.5A
FUEL APU CB09 10A
K6 BATT RELAY
EXT PWR CONNECTOR J14
(NOTE 3)
EXT PWR (NOTE 5) S13
CLOSE
OPEN
EXT PWR DOOR
CHARGER (NOTE 5)
HOT BAT (NOTE 5)
AVIONICS CONFIGURATION (NOTE 7)
BT2 BATTERY CHARGER
RECT 1 (NOTE 5)
RECT 2 (NOTE 5)
DC CONTATOR
T/R CONTACTOR 1
T/R CONTACTOR 2
DC BUS TIE CONTACTOR
OVER CURRENT RELAY
+28 VDC IN
+28 VDC OUT
TB1-3 DC BUS 1
TB1-2 DC BUS 2
W3 DC BUS 3
TB1-1 EMERG DC BUS
PS1 XFMR/RECT 1
XFMR RECT 1 CB1 35A
PS2 XFMR/RECT 2
XFMR RECT 2 CB4 35A
HOT RECT 1 (NOTE 5)
HOT RECT 2 (NOTE 5)
0A1
0B1
0C1
0A2
0B2
0C2
MM04/1-912A

NOTES:

1. GENERATORS SUPPLY 115/200 VAC, 3 0 THRU CONTACTORS AND AC BUSES TO XMFR/RECTIFIERS WHICH PROVIDE 28 VDC TO DC BUSES.
2. ESSENTIAL AC BUSES 1 AND 2 ARE NOT PHYSICAL COMPONENTS. THE BUSES ARE 2 GROUPS OF CIRCUIT BREAKERS AND THEIR WIRING IN PILOT AND CPG CIRCUIT BREAKER PANELS.
3. WHEN EXTERNAL POWER IS APPLIED, GEN 1 CONTACTOR ENERGIZES PROVIDING EXTERNAL AC POWER TO GEN 1 CONTACTOR TERMINALS A1, B1, C1 AND GEN 2 CONTACTOR TERMINALS A2, B2, C2.
4. BATT POSITION CLOSES BATT RELAY CONNECTING BATTERY TO EMERGENCY DC BUS. APU CAN START WITHOUT CONNECTING BATTERY TO EMERGENCY BUS.
5. CAUTION/WARNING INDICATORS.
6. GCU 1 IS IDENTICAL TO GCU 2.
7. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

9-2-1. AC ELECTRICAL POWER GENERATION - FD/LS CHECK

Personnel Required:

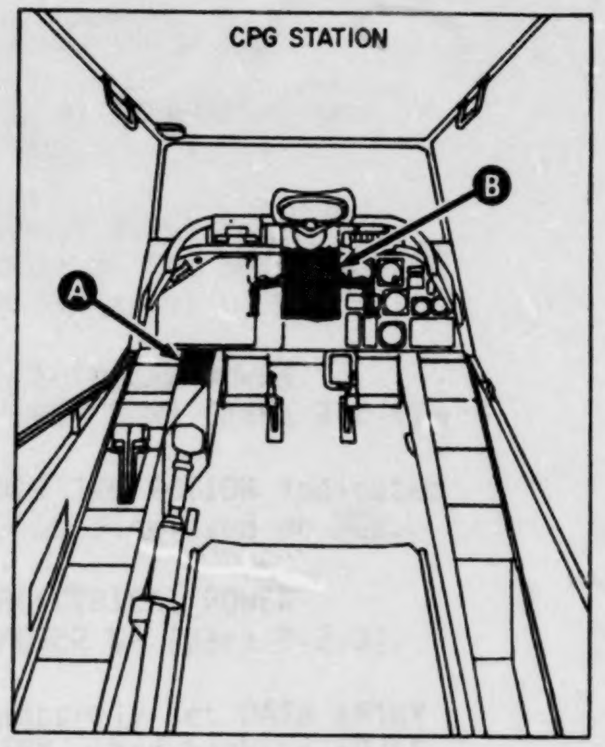
68J10 Aircraft Fire Control Repairer or
67R20 Attack Helicopter Repairer

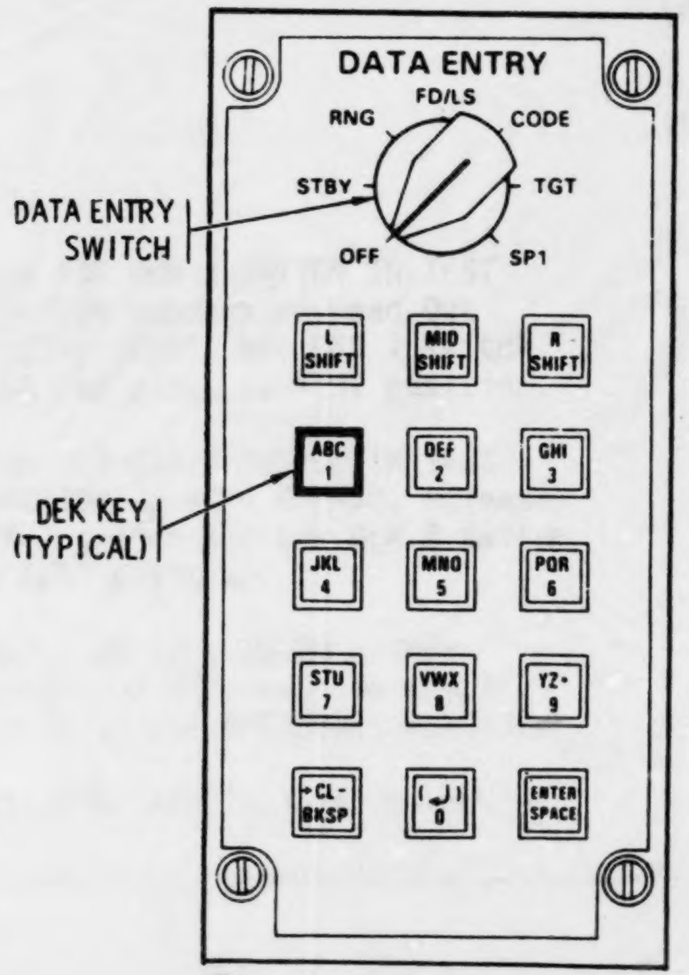
References:

TM 55-1520-238-23

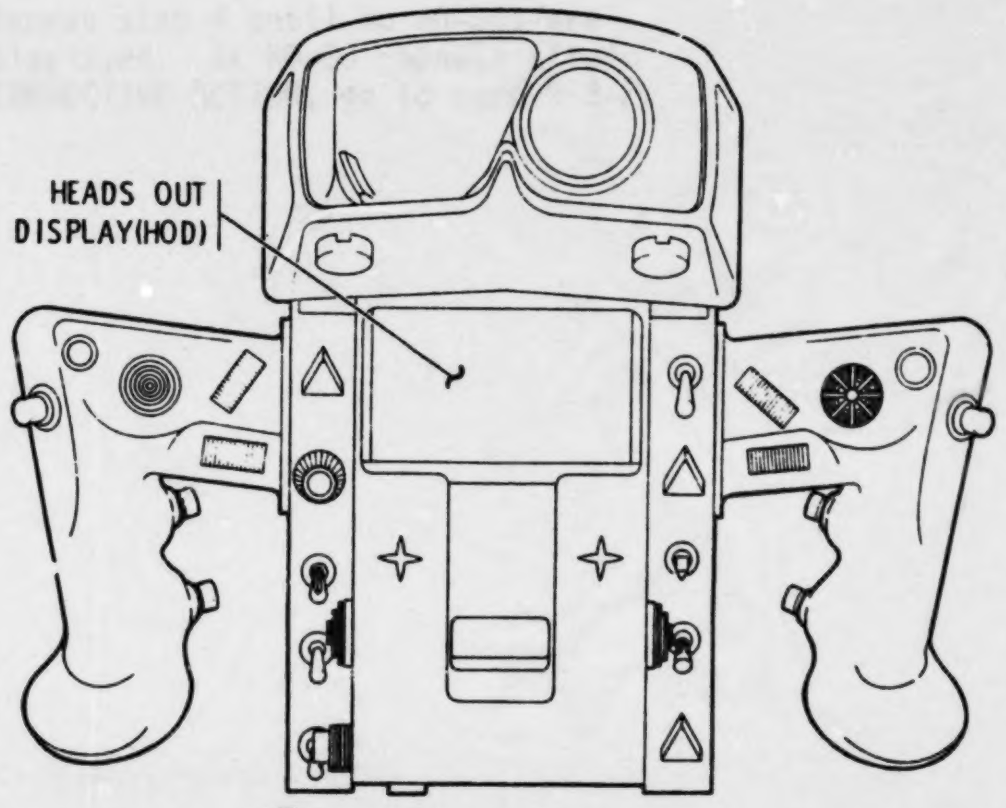
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-2-3	AC ELECTRICAL POWER GENERATION - POWER UP completed
Chapter 1	FD/LS OPERATION - STARTING completed


CPG STATION
A
B


DATA ENTRY
FD/LS
RNG
CODE
STBY
TGT
OFF
SP1
DATA ENTRY SWITCH
L SHIFT
MID SHIFT
R SHIFT
ABC 1
DEF 2
GHI 3
JKL 4
MNO 5
PQR 6
STU 7
VWX 8
YZ* 9
CL BKSP
0
ENTER SPACE
DEK KEY (TYPICAL)

Ⓐ DATA ENTRY KEYBOARD (DEK)


HEADS OUT DISPLAY(HOD)

Ⓑ OPTICAL RELAY TUBE (ORT)

MM04/1-804A

NOTE

- Control/switch position changes prompted by FD/LS must be performed within 30 seconds of prompt message, or false **NO-GO** message will appear.
- If FD/LS message on HOD does not change within 2 seconds after prompted control/switch position change (acknowledge) discontinue FD/LS test and go to para 9-2-2.

A. Perform FD/LS check as follows:

TASK	RESULT
1. On data entry keyboard (DEK) verify **DATA ENTRY** switch is set to **FD/LS**.	
2. Depress any DEK key except **ENTER SPACE** or **SHIFT**.	If FD/LS menu does not appear on HOD, refer to TM 9-1230-476-20-2 to troubleshoot the multiplex subsystem.
3. Depress DEK keys **0** (zero) and **8**.	If **MUX COMMUNICATION GO** appears on HOD, go to next step. If any **MUX NO-GO** appears on HOD, refer to TM 9-1230-476-20-2 to troubleshoot multiplex system.

GO TO NEXT PAG

9-2-1. AC ELECTRICAL POWER GENERATION - FD/LS CHECK (cont)

TASK	RESULT
4. Depress any key except ENTER SPACE or SHIFT key, then depress keys 1 and 8.	If GENERATOR SYSTEMS GO appears on HOD, go to next step. If one or more FD/LS NO-GO DISPLAYS listed below appear on the HOD, perform the following in sequence: (a) Perform AC ELECTRICAL POWER GENERATION POWER DOWN (para 9-2-4). (b) Perform CORRECTIVE ACTION indicated for first NO-GO displayed on HOD. (c) Perform AC ELECTRICAL POWER GENERATION POWER UP (para 9-2-3). (d) On DEK, momentarily set DATA ENTRY switch to STBY, then back to FD/LS. (e) Depress any DEK key except ENTER SPACE and SHIFT keys. (f) Repeat step 4 until no NO-GOs are displayed. If NO-GO repeats after CORRECTIVE ACTION, go to para 9-2-2.
5. When PUT GEN 1 SWITCH IN TEST POSITION appears on Head Out Display (HOD), set GEN 1 switch ELEC PWR panel to TEST position.	
6. When PUT GEN 2 SWITCH IN TEST POSITION appears on HOD, release GEN 1 switch and set GEN 2 switch to TEST position.	
7. When a GO or a NO-GO display appears on HOD, release GEN 2 switch to the OFF/RESET position.	
8. Set DATA ENTRY switch to OFF.	

B. Perform FD/LS OPERATION - STOPPING (Chapter 1).

C. If Operational Check is to be performed, go to para 9-2-2.

D. Perform AC ELECTRICAL POWER GENERATION - POWER DOWN (para 9-2-4).

FD/LS NO-GO DISPLAY	CORRECTIVE ACTION	FD/LS NO-GO DISPLAY	CORRECTIVE ACTION
GENERATOR 1 NO-GO LH XMSN BAY	Replace generator 1 (TM 55-1520-238-23)	GENERATOR 1 CONTROL NO-GO POWER CENTER	Replace generator 1 control (TM 55-1520-238-23)
GENERATOR 2 NO-GO RH XMSN BAY	Replace generator 2 (TM 55-1520-238-23)	GENERATOR 2 CONTROL NO-GO POWER CENTER	Replace generator 2 control (TM 55-1520-238-23)

END OF TASK

9-2-2. AC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Equipment Conditions:

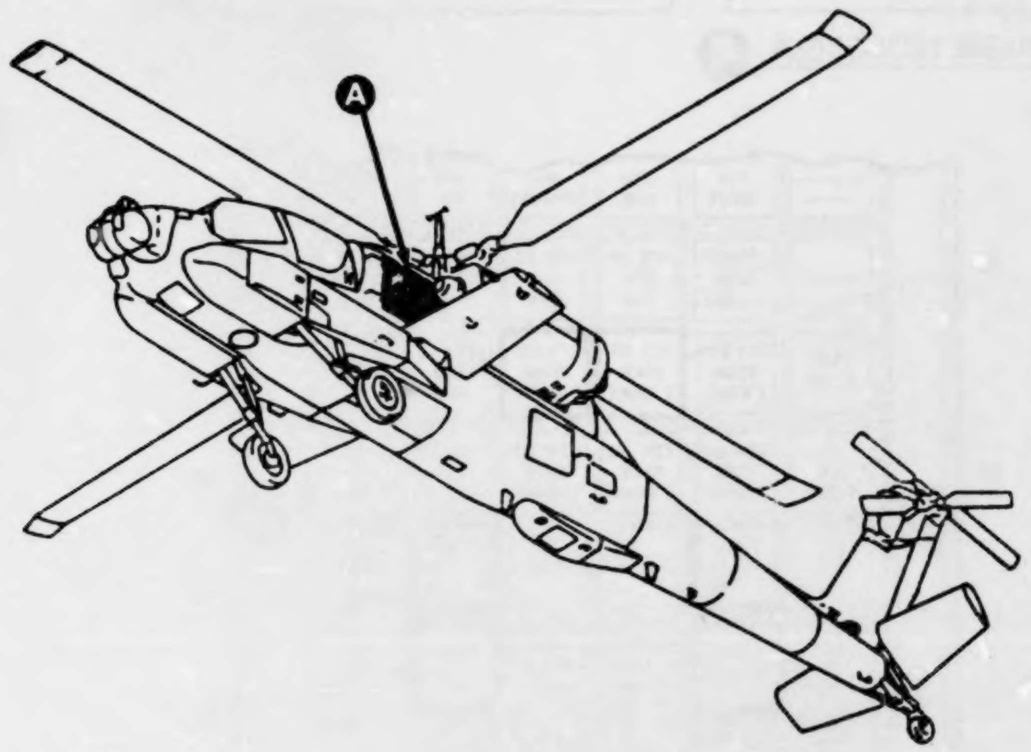
Ref	Condition
TM 55-1520-238-23	Helicopter safed Power generation and distribution - inspection performed
Para 9-2-3	AC ELECTRICAL POWER GENERATION - POWER UP completed

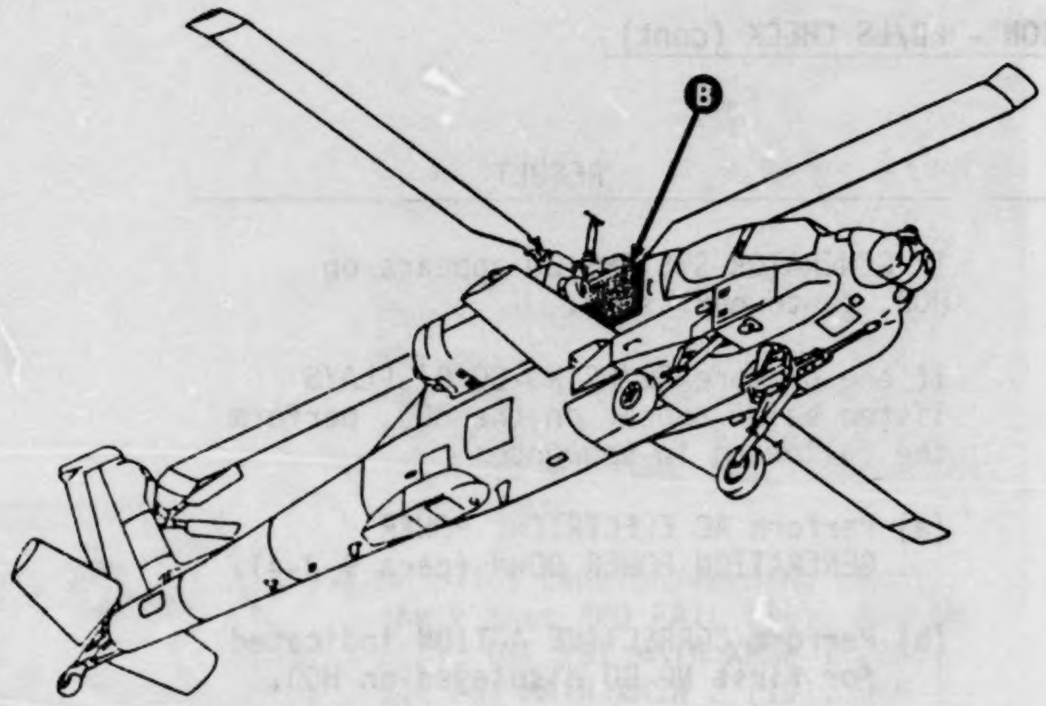
Personnel Required:

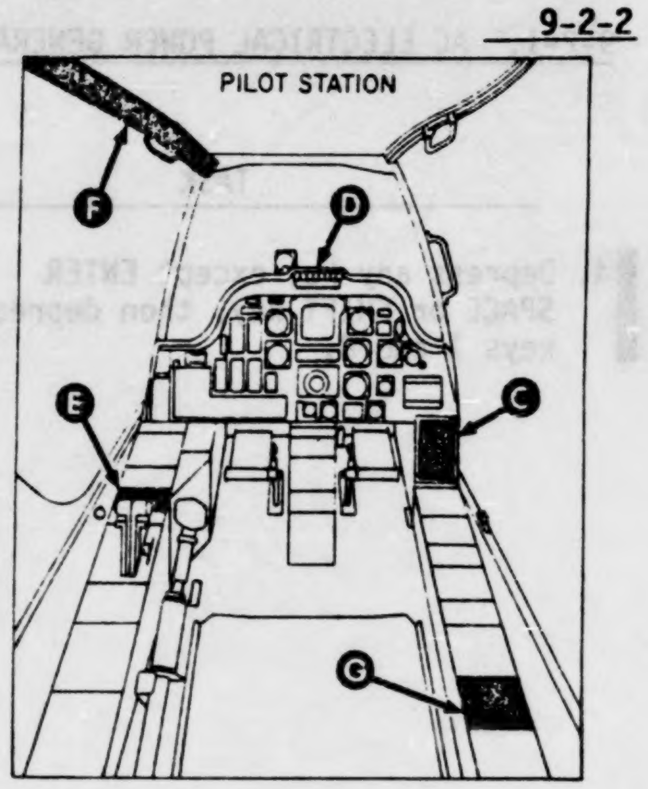
67R20 Attack Helicopter Repairer
68F10 Aircraft Electrician

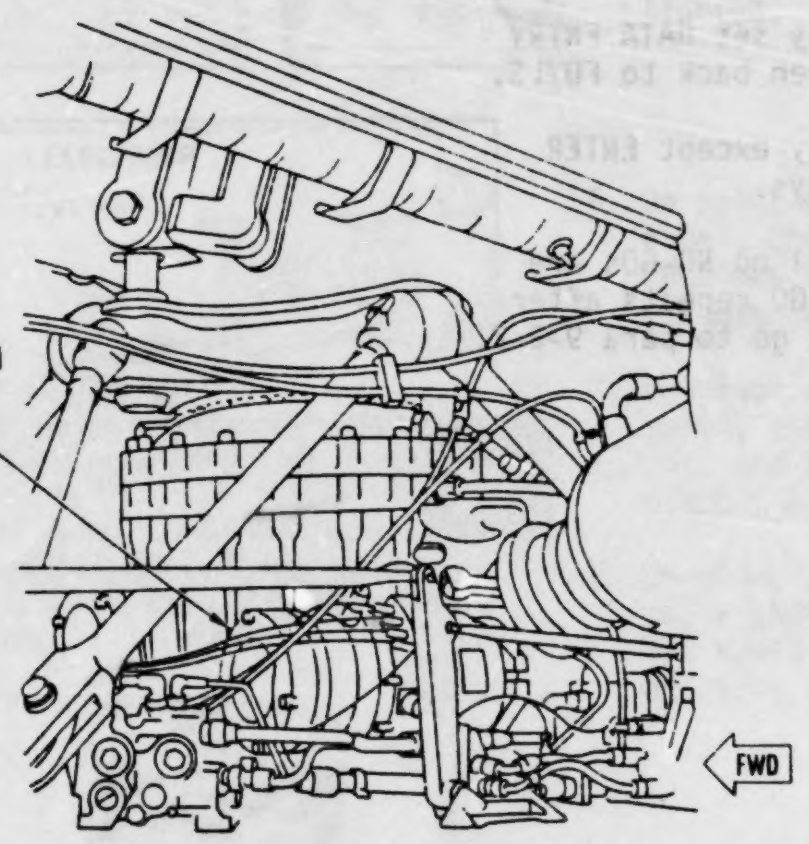
References:

TM 55-1520-238-23

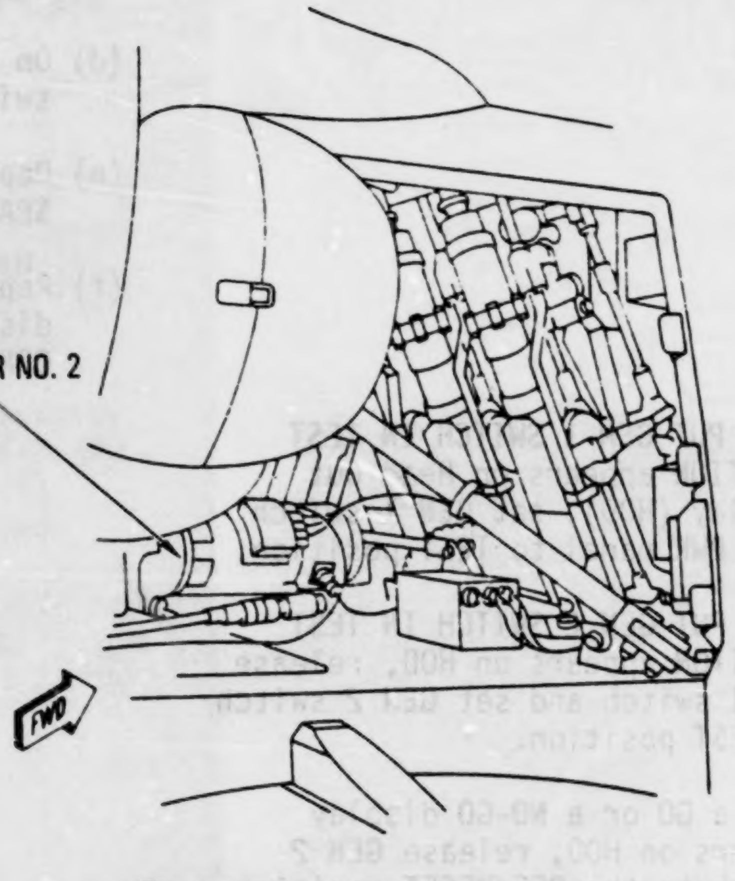








Ⓐ MAIN DECK THROUGH ACCESS PANEL L200



Ⓑ MAIN DECK THROUGH ACCESS PANEL R200

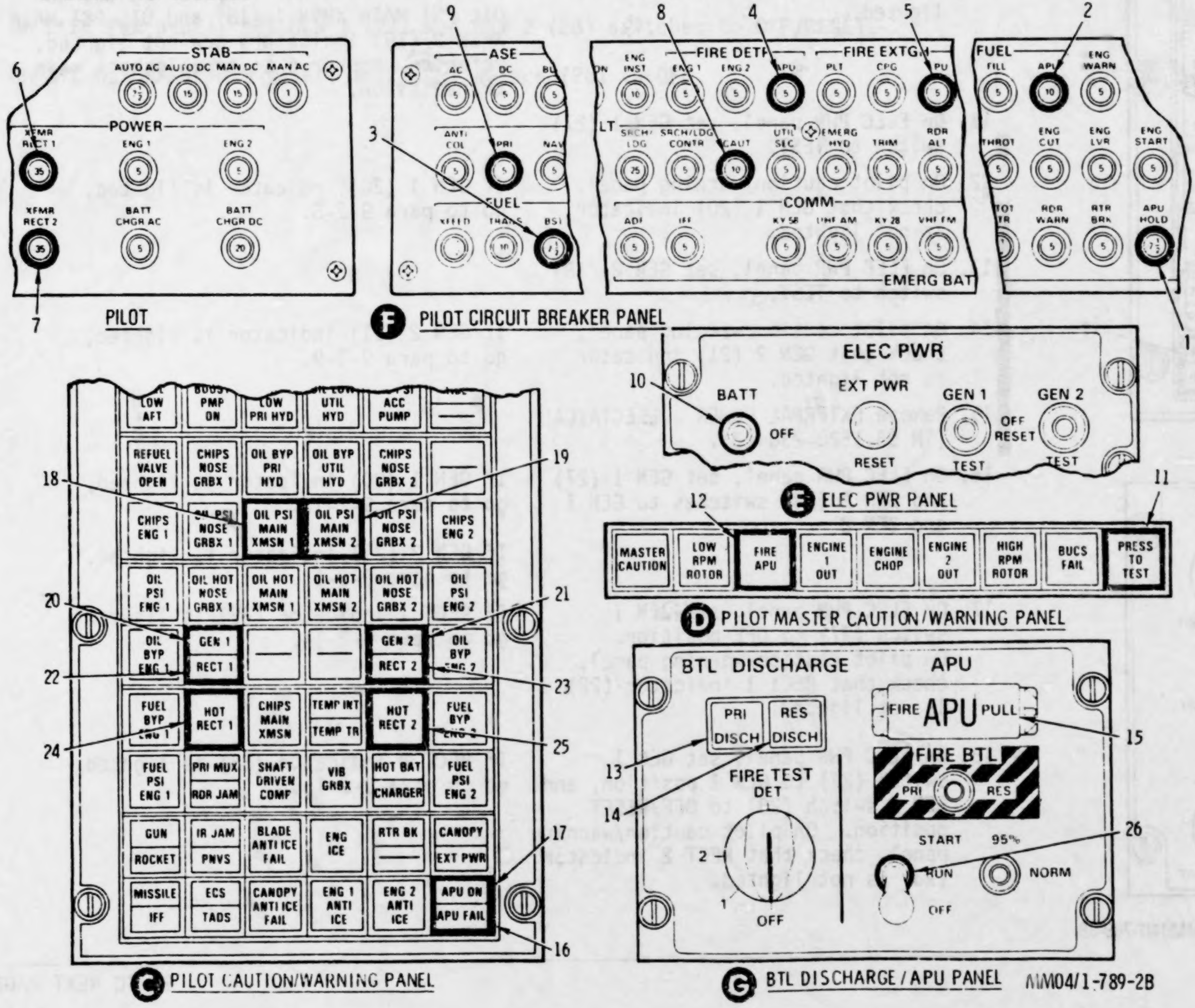
MM04/1-789-1B

GO TO NEXT PAGE

9-2-2. AC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (10) to **BATT**.	
2. On pilot circuit breaker panel, check that **LT CAUT** (8) circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-31-4.
3. On pilot master caution/warning panel, depress **PRESS TO TEST** indicator (11).	
4. On pilot master caution/warning panel, check that **FIRE APU** (12) indicator is lighted. On **BTL DISCHARGE/APU PANEL**, check that **PRI DISCH** (13), **RES DISCH** (14), and **FIRE APU PULL** (15) indicators are lighted.	If indicator(s) are not lighted, go to para 9-31-1.
5. On pilot caution/warning panel, check that **APU FAIL** (16), **APU ON** (17), **OIL PSI MAIN XMSN 1** (18), **OIL PSI MAIN XMSN 2** (19), **GEN 1** (20), **GEN 2** (21), **RECT 1** (22), **RECT 2** (23), **HOT RECT 1** (24), and **HOT RECT 2** (25) indicators are lighted.	If **GEN 1** (20) indicator is not lighted, go to para 9-2-10. If **GEN 2** (21) indicator is not lighted, go to para 9-2-7. If **APU FAIL** (16), **APU ON** (17), **OIL PSI MAIN XMSN 1** (18), **OIL PSI MAIN XMSN 2** (19), **RECT 1** (22), **RECT 2** (23), **HOT RECT 1** (24), or **HOT RECT 2** (25) indicator(s) are not lighted, go to para 9-30-1.
6. On pilot center circuit breaker panel, check that **APU HOLD** (1), **FUEL APU** (2), and **FUEL BST** (3) circuit breakers are closed.	If circuit breaker(s) do not stay closed, refer to chapter 15 to troubleshoot APU.
7. On pilot center circuit breaker panel, check that **FIRE DETR APU** (4), and **FIRE EXTGH APU** (5) circuit breakers are closed.	If circuit breaker(s) do not stay closed, refer to chapter 12 to troubleshoot APU fire detection and extinguishing.
8. On pilot aft circuit breaker panel, check that **POWER XFMR RECT 1** (6) and **POWER XFMR RECT 2** (7) circuit breakers are closed.	If **POWER XFMR RECT 1** (6) does not stay closed, go to para 9-3-6. If **POWER XFMR RECT 2** (7) does not stay closed, go to para 9-3-7.


STAB
AUTO AC
AUTO DC
MAN DC
MAN AC
POWER
XFMR RECT 1
ENG 1
ENG 2
XFMR RECT 2
BATT CHGR AC
BATT CHGR DC
PILOT
ASE
AC
DC
ANTI COL
PRI
NAV
FUEL
XFEED
TRANS
BST
FIRE DETR
FIRE EXTGH
ENG INST
ENG 1
ENG 2
APU
PLT
CPG
SRCH/LDG
SRCH/LDG CONTR
CAUT
UTIL SEC
EMERG HYD
TRIM
RDR ALT
COMM
ADF
IFF
KY 58
UHF AM
KY 28
VHF FM
EMERG BAT
FUEL
FILL
APU
ENG WARN
THROT
ENG CUT
ENG LVR
ENG START
RDR WARN
RTR BRK
APU HOLD
ELEC PWR
BATT
EXT PWR
OFF
RESET
GEN 1
GEN 2
TEST
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST
LOW AFT
BOOST PMP ON
LOW PRI HYD
LOW UTIL HYD
ACC PUMP
REFUEL VALVE OPEN
CHIPS NOSE GRBX 1
OIL BYP PRI HYD
OIL BYP UTIL HYD
CHIPS NOSE GRBX 2
CHIPS ENG 1
OIL PSI NOSE GRBX 1
OIL PSI MAIN XMSN 1
OIL PSI MAIN XMSN 2
OIL PSI NOSE GRBX 2
CHIPS ENG 2
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL
BTL DISCHARGE
APU
PRI DISCH
RES DISCH
FIRE APU PULL
FIRE BTL
PRI
RES
FIRE TEST DET
START
95%
RUN
OFF
NORM
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26

F PILOT CIRCUIT BREAKER PANEL

E ELEC PWR PANEL

D PILOT MASTER CAUTION/WARNING PANEL

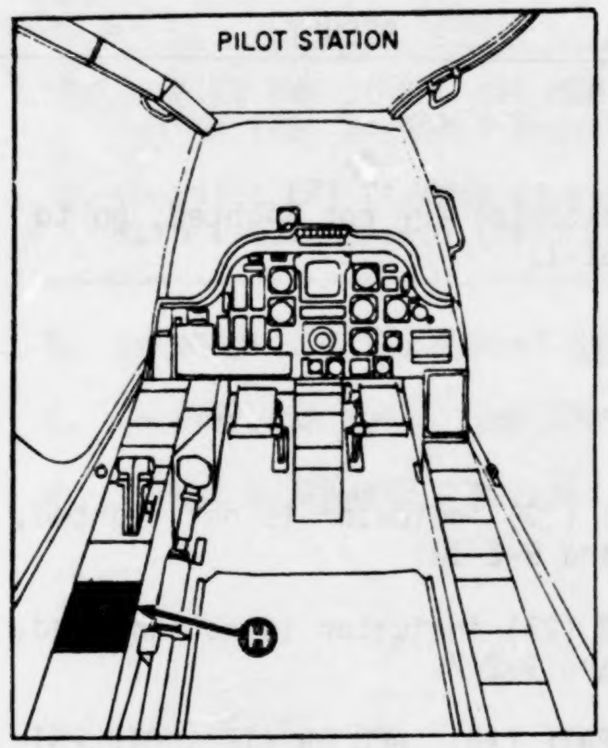
C PILOT CAUTION/WARNING PANEL

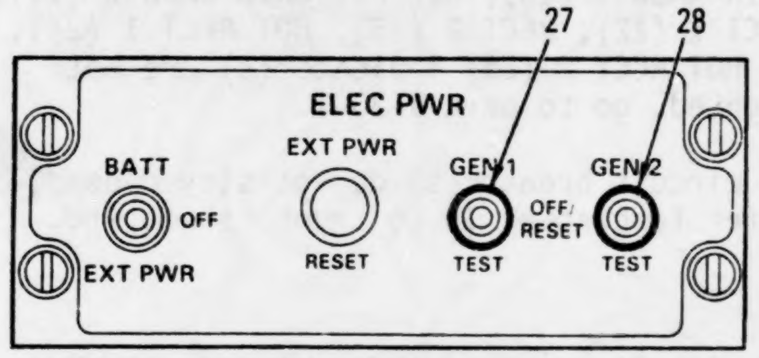
G BTL DISCHARGE/APU PANEL

MM04/1-789-2B

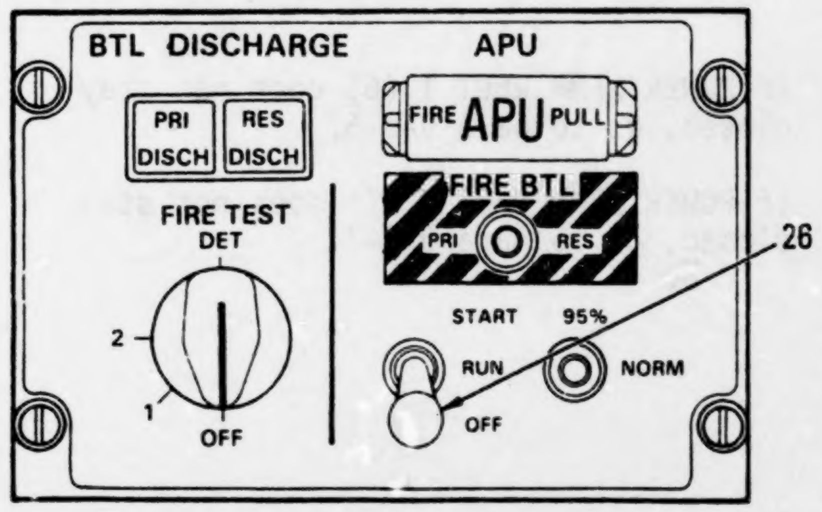
GO TO NEXT PAGE

9-2-2. AC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

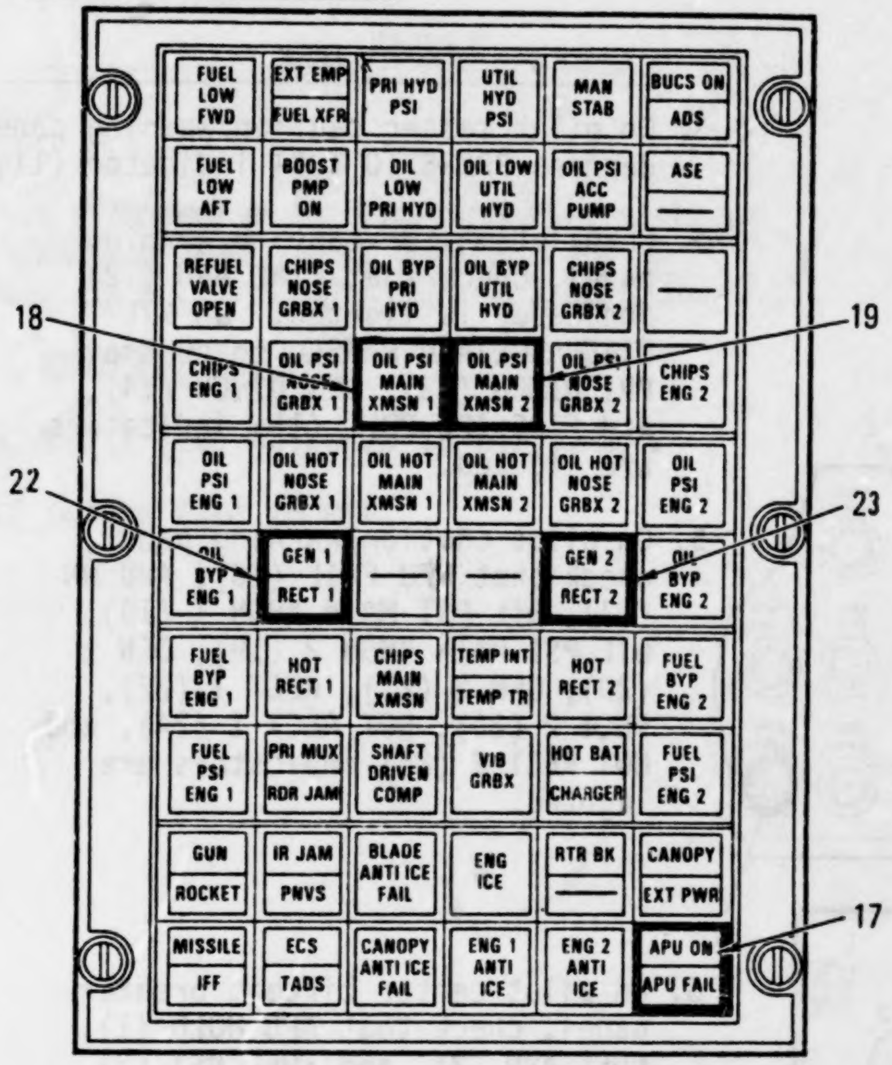

PILOT STATION
H


27
28
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
GEN 2
OFF/
RESET
TEST
TEST

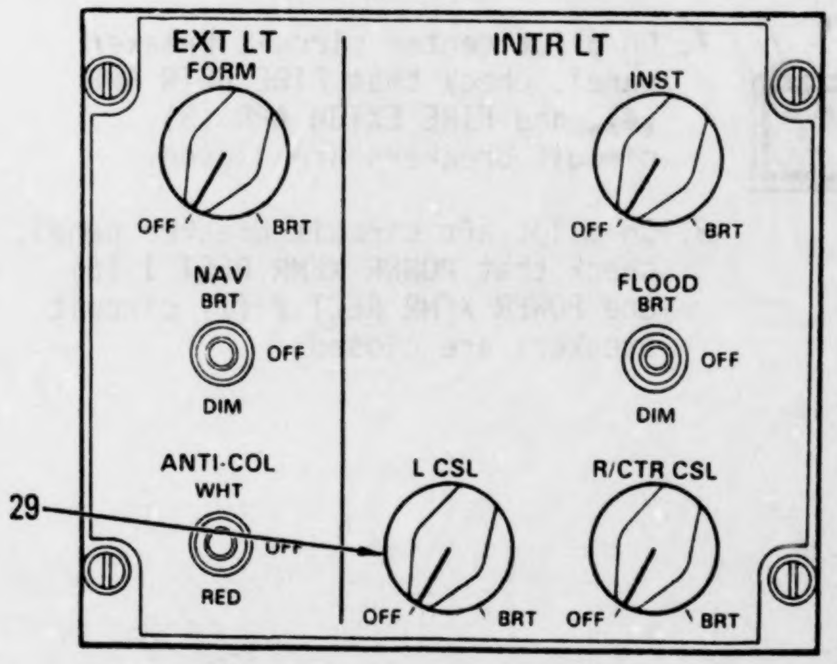
ELEC PWR PANEL


BTL DISCHARGE
APU
PRI
DISCH
RES
DISCH
FIRE
APU
PULL
FIRE BTL
PRI
RES
FIRE TEST
DET
2
1
OFF
START
95%
RUN
NORM
OFF
26

BTL DISCHARGE/APU PANEL


FUEL LOW FWD
EXT EMP
FUEL XFR
PRI HYD PSI
UTIL HYD PSI
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
BOOST PMP ON
OIL LOW PRI HYD
OIL LOW UTIL HYD
OIL PSI ACC PUMP
ASE
REFUEL VALVE OPEN
CHIPS NOSE GRBX 1
OIL BYP PRI HYD
OIL BYP UTIL HYD
CHIPS NOSE GRBX 2
CHIPS ENG 1
OIL PSI NOSE GRBX 1
OIL PSI MAIN XMSN 1
OIL PSI MAIN XMSN 2
OIL PSI NOSE GRBX 2
CHIPS ENG 2
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL
18
19
22
23
17

PILOT CAUTION/WARNING PANEL


EXT LT
FORM
OFF
BRT
NAV
BRT
OFF
DIM
ANTI-COL
WHT
OFF
RED
INTR LT
INST
OFF
BRT
FLOOD
BRT
OFF
DIM
L CSL
OFF
BRT
R/CTR CSL
OFF
BRT
29

H PILOT EXT LT/INTR LT PANEL

MM04/1-789-3B

TASK	RESULT
9. On pilot center circuit breaker panel, check that LT PRI (9) circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-13-4.
10. On pilot caution/warning panel, check that **APU ON** (17), **OIL PSI MAIN XMSN 1** (18), and **OIL PSI MAIN XMSN 2** (19) indicators are lighted.	If **APU ON** indicator (17) is not lighted, refer to chapter 15 to troubleshoot APU. If **APU ON** indicator (17) is lighted and **OIL PSI MAIN XMSN 1** (18) and **OIL PSI MAIN XMSN 2** (19) indicators are not lighted, refer to chapter 6 to troubleshoot main transmission.
11. On ELEC PWR panel, set **GEN 1** (27) switch to **TEST**.	
12. On pilot caution/warning panel, check that **GEN 1** (20) indicator is not lighted.	If **GEN 1** (20) indicator is lighted, go to para 9-2-8.
13. On ELEC PWR panel, set **GEN 2** (28) switch to **TEST**.	
14. On pilot caution/warning panel, check that **GEN 2** (21) indicator is not lighted.	If **GEN 2** (21) indicator is lighted, go to para 9-2-9.
15. Remove EXTERNAL POWER - ELECTRICAL (TM 55-1520-238-23).	
16. On ELEC PWR panel, set **GEN 1** (27) and **GEN 2** (28) switches to **GEN 1** and **GEN 2**.	If **GEN 1** (20) indicator is lighted, go to para 9-2-12. If **GEN 2** (21) indicator is lighted, go to para 9-2-13.
17. On ELEC PWR panel, set **GEN 1** switch (27) to **OFF** position. On pilot caution/warning panel, check that **RECT 1** indicator (22) is not lighted.	If **RECT 1** indicator (22) is lighted, go to para 9-2-14.
18. On ELEC PWR panel, set **GEN 1** switch (27) to **GEN 1** position, and **GEN 2** switch (28) to **OFF/RESET** position. On pilot caution/warning panel, check that **RECT 2** indicator (23) is not lighted.	If **RECT 2** indicator (23) is lighted, go to para 9-2-15.

GO TO NEXT PAGE

9-2-2. AC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

TASK	RESULT
19. On **ELEC PWR** panel, set **GEN 2** switch (28) to **GEN 2** position.	
20. On pilot **EXT LT/INTR LT** panel, turn **L CSL** control (29) to **BRT.**	If **ELEC PWR** panel edge-lighting does not come on, go to para 9-2-11.

B. On pilot **EXT LT/INTR LT** panel, turn **L CSL** (29) to **OFF.**

C. On **ELEC PWR** panel, set **GEN 1** (27) and **GEN 2** (28) switches to **OFF/RESET.**

D. On **BTL DISCHARGE/APU** panel, set **START** switch (26) to **OFF.**

END OF TASK

9-2-3. AC ELECTRICAL POWER GENERATION - POWER UP

Personnel Required:

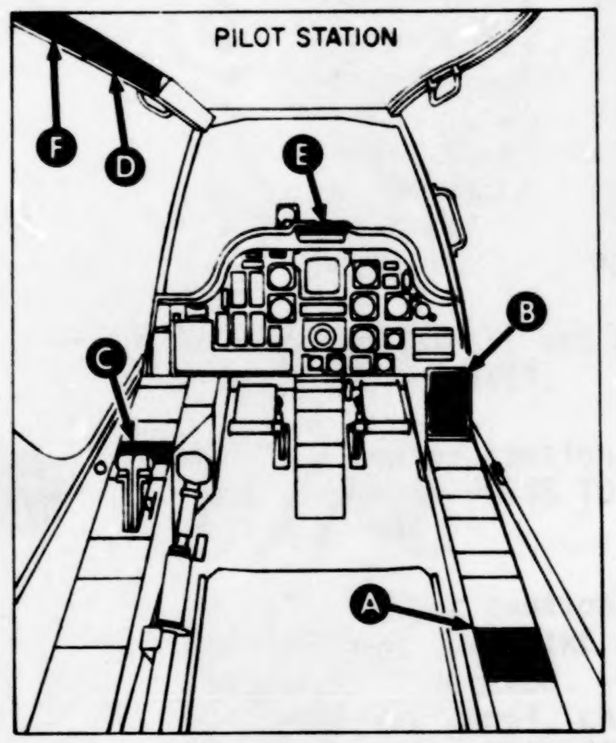
67R20 Attack Helicopter Repairer

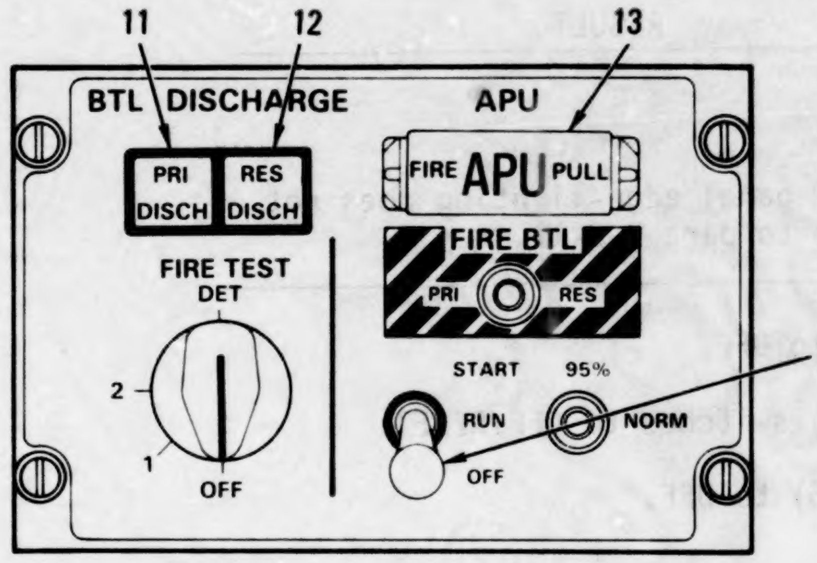
References:

TM 55-1520-238-23

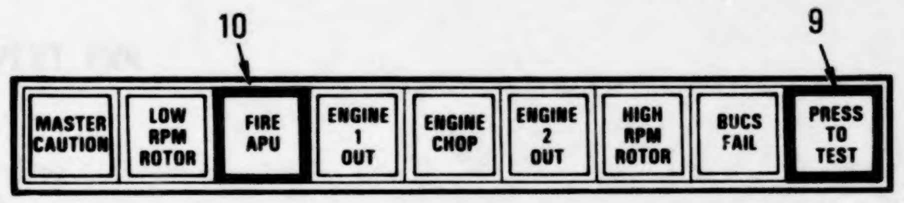
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

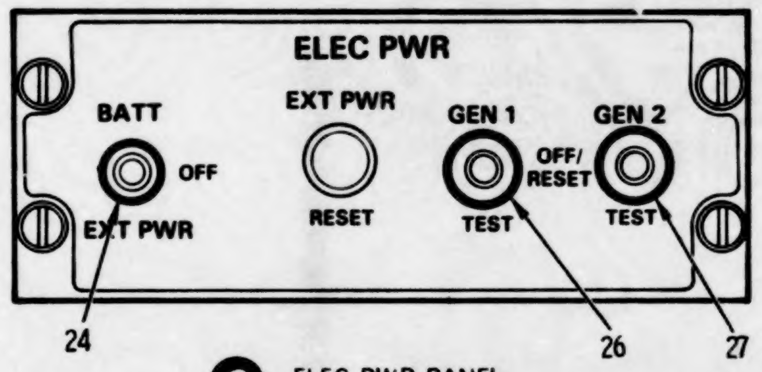

PILOT STATION
F
D
E
B
C
A


11
12
13
BTL DISCHARGE
PRI DISCH
RES DISCH
APU
FIRE APU PULL
FIRE BTL
PRI
RES
FIRE TEST DET
2
1
OFF
START
95%
RUN
NORM
OFF
25

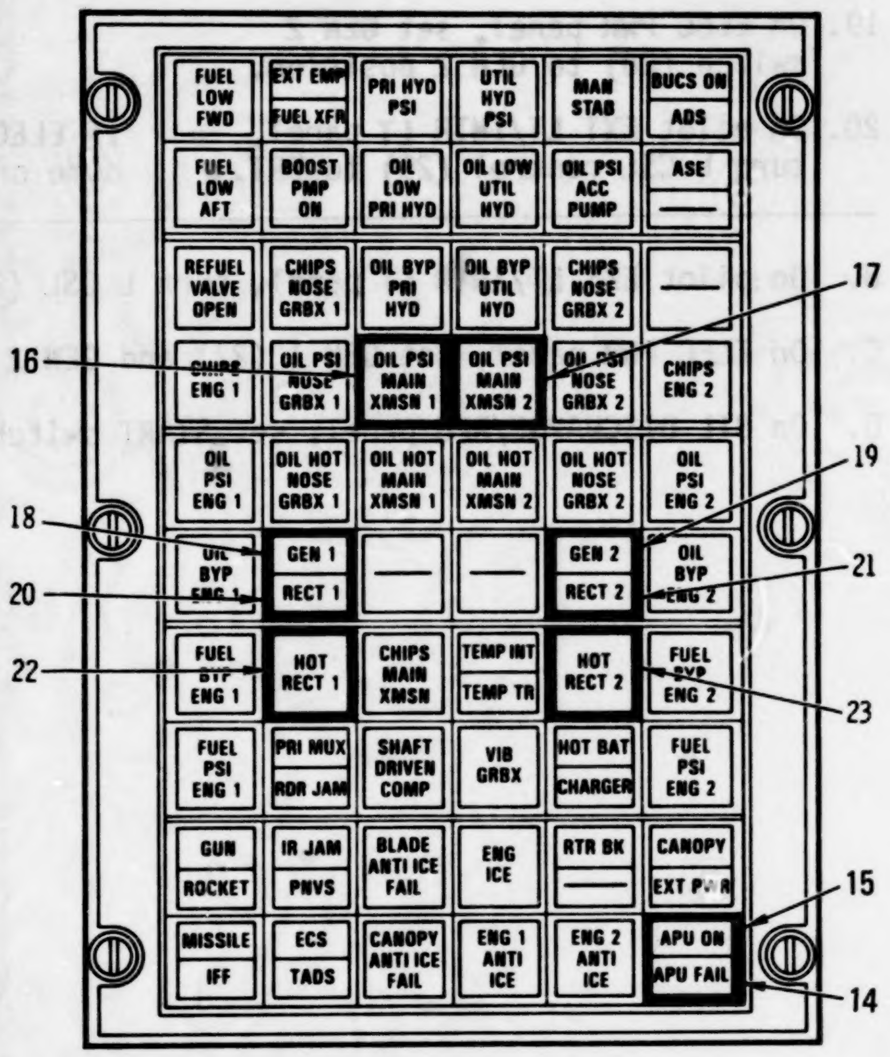
A BTL DISCHARGE / APU PANEL


10
9
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

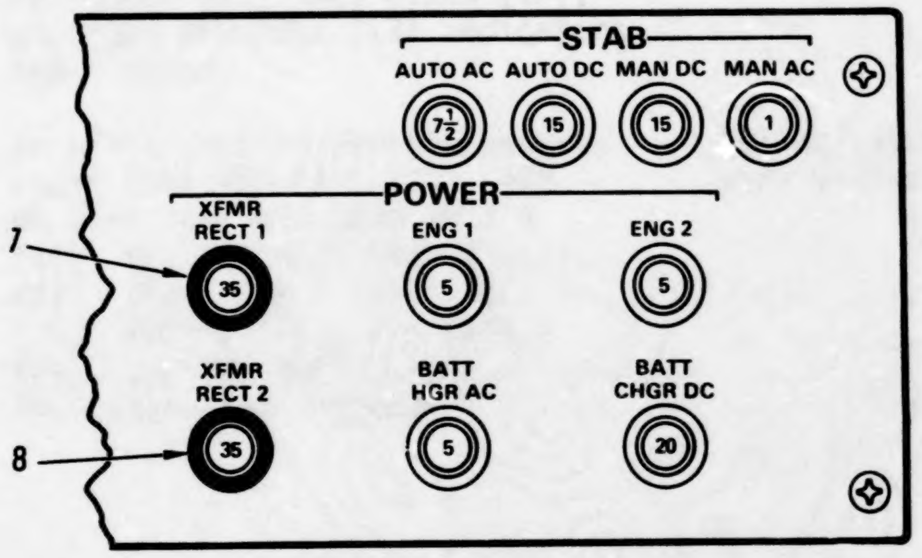
E PILOT MASTER CAUTION / WARNING PANEL


ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
GEN 2
OFF/ RESET
TEST
TEST
24
26
27

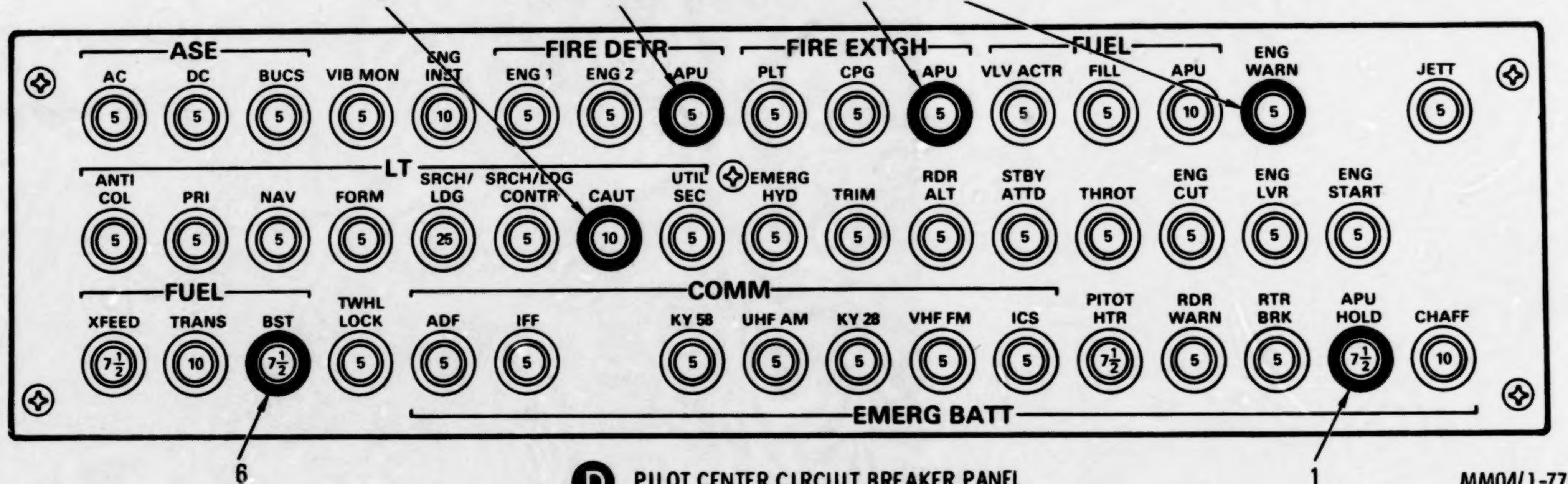
C ELEC PWR PANEL


FUEL LOW FWD
EXT EMP
FUEL XFR
PRI HYD PSI
UTIL HYD PSI
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
BOOST PMP ON
OIL LOW PRI HYD
OIL LOW UTIL HYD
OIL PSI ACC PUMP
ASE
REFUEL VALVE OPEN
CHIPS NOSE GRBX 1
OIL BYP PRI HYD
OIL BYP UTIL HYD
CHIPS NOSE GRBX 2
CHIPS ENG 1
OIL PSI NOSE GRBX 1
OIL PSI MAIN XMSN 1
OIL PSI MAIN XMSN 2
OIL PSI NOSE GRBX 2
CHIPS ENG 2
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL
16
17
18
19
20
21
22
23
15
14

B PILOT CAUTION / WARNING PANEL


STAB
AUTO AC 7½
AUTO DC 15
MAN DC 15
MAN AC 1
POWER
XFMR RECT 1 35
ENG 1 5
ENG 2 5
XFMR RECT 2 35
BATT HGR AC 5
BATT CHGR DC 20
7
8

F PILOT AFT CIRCUIT BREAKER PANEL


5
4
3
2
ASE
AC 5
DC 5
BUCS 5
VIB MON 5
ENG INST 10
FIRE DETR
ENG 1 5
ENG 2 5
APU 5
FIRE EXTGH
PLT 5
CPG 5
APU 5
FUEL
VLV ACTR 5
FILL 5
APU 10
ENG WARN 5
JETT 5
ANTI COL 5
LT
PRI 5
NAV 5
FORM 5
SRCH/ LDG 25
SRCH/LDG CONTR 5
CAUT 10
UTIL SEC 5
EMERG HYD 5
TRIM 5
RDR ALT 5
STBY ATTD 5
THROT 5
ENG CUT 5
ENG LVR 5
ENG START 5
FUEL
XFEED 7½
TRANS 10
BST 7½
TWHL LOCK 5
COMM
ADF 5
IFF 5
KY 58 5
UHF AM 5
KY 28 5
VHF FM 5
ICS 5
PITOT HTR 7½
RDR WARN 5
RTR BRK 5
APU HOLD 7½
CHAFF 10
EMERG BATT
6
1

D PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-779B

GO TO NEXT PAGE

9-2-3. AC ELECTRICAL POWER GENERATION - POWER UP (cont)

A. Complete the power up procedure as follows:

TASK	RESULT
1. On pilot circuit breaker panel, check that the following circuit breakers are closed:	If circuit breaker(s) do not stay closed, go to para 9-2-2.

Item No.	Pilot Circuit Breaker Panel	Name
1	Center Panel	APU HOLD
2	Center Panel	FUEL APU
3	Center Panel	FIRE EXTGH APU
4	Center Panel	FIRE DETR APU
5	Center Panel	LT CAUT
6	Center Panel	FUEL BST
7	Aft Panel	POWER XFMR RECT 1
8	Aft Panel	POWER XFMR RECT 2

TASK	RESULT
2. On ELEC PWR panel, set BATT/EXT PWR switch (24) to BATT.	
3. On pilot master caution/warning panel, depress PRESS TO TEST indicator (9).	
4. On pilot master caution/warning panel, check that FIRE APU (10) indicator is lighted. On BTL DISCHARGE/APU panel, check that PRI DISCH (11), RES DISCH (12), and FIRE APU PULL (13) indicators are lighted.	If indicator(s) are not lighted, go to para 9-31-1.
5. On pilot caution/warning panels, check that APU FAIL (14), APU ON (15), OIL PSI MAIN XMSN 1 (16), OIL PSI MAIN XMSN 2 (17), GEN 1 (18), GEN 2 (19), RECT 1 (20), RECT 2 (21), HOT RECT 1 (22), and HOT RECT 2 (23) indicators are lighted.	If indicator(s) are not lighted, go to para 9-30-1.
6. On BTL DISCHARGE/APU panel, hold START switch (25) in START position for three seconds and release to RUN position.	
7. On pilot caution/warning panel, check that APU ON, OIL PSI MAIN XMSN 1 (16), and OIL PSI MAIN XMSN 2 (17) indicators are lighted.	If APU ON indicator (15) is not lighted, go to chapter 15 to troubleshoot the APU. If APU ON indicator (15) is lighted and OIL PSI MAIN XMSN 1 (16) and OIL PSI MAIN XMSN 2 (17) indicators are not lighted, go to chapter 6 to troubleshoot the main transmission.
8. On ELEC PWR Panel, set GEN 1 (26) and GEN 2 (27) switches to TEST.	
9. On pilot caution/warning panel, check that GEN 1 (18), and GEN 2 (19)indicators are not lighted.	If GEN 1 (18) indicator is lighted, go to para 9-2-8. If GEN 2 (19) indicator is lighted, go to para 9-2-9.

NOTE

If AC Electrical Power Generation - FD/LS Check is to be performed, do not perform step 10, below.

10. On ELEC PWR panel, set GEN 1 and GEN 2 switches to GEN 1 and GEN 2.

END OF TASK

9-2-4. AC ELECTRICAL POWER GENERATION - POWER DOWN

Personnel Required:

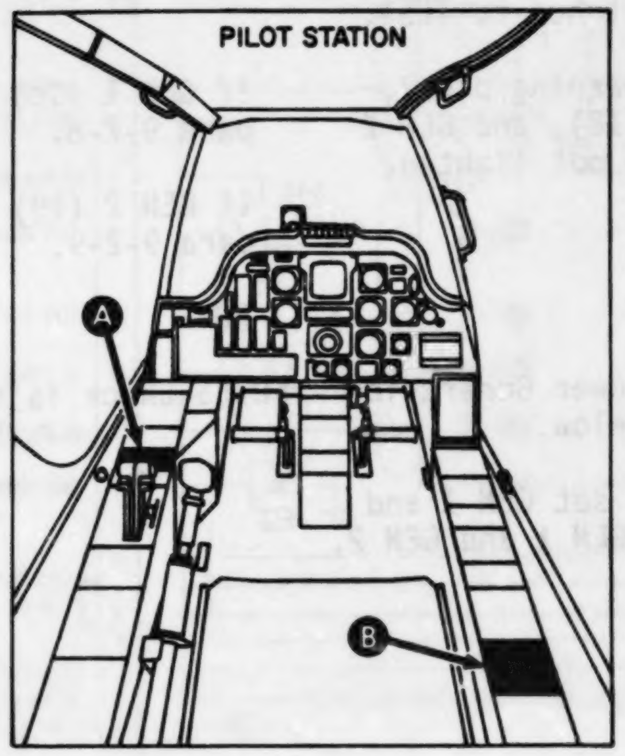
67R20 Attack Helicopter Repairer

References:

TM 55-1520-238-23

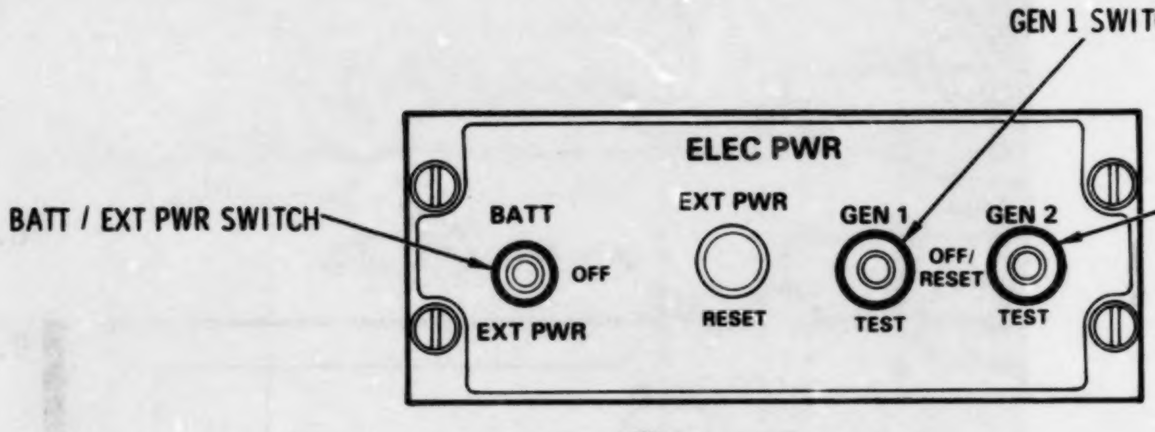
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed

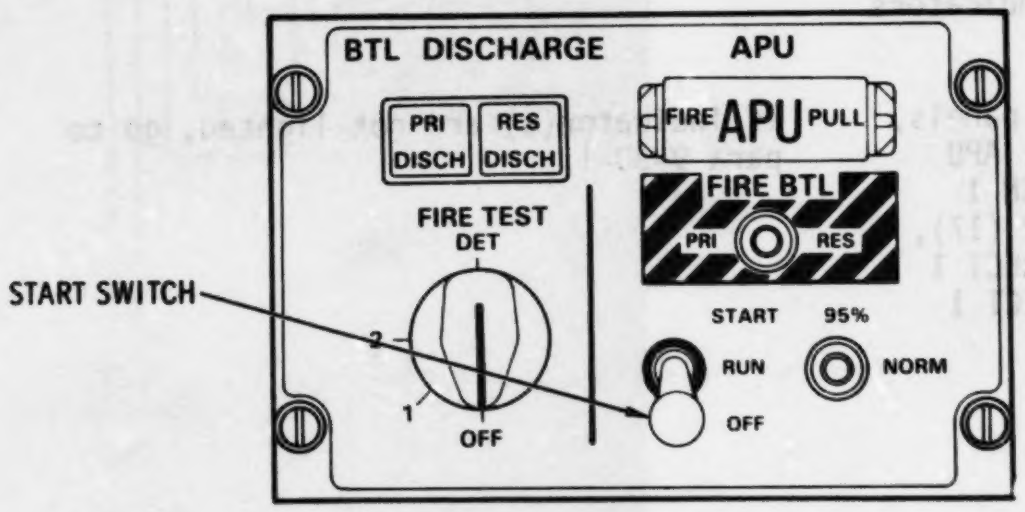

PILOT STATION
A
B

A. At pilot station, set switches and controls as follows:

Location	Switch	Position
ELEC PWR panel	GEN 1	OFF
ELEC PWR panel	GEN 2	OFF
BTL DISCHARGE/APU panel	START	OFF
ELEC PWR panel	BATT/EXT PWR	OFF


GEN 1 SWITCH
ELEC PWR
BATT / EXT PWR SWITCH
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
OFF/
RESET
TEST
GEN 2
TEST
GEN 2 SWITCH

Ⓐ ELEC PWR PANEL

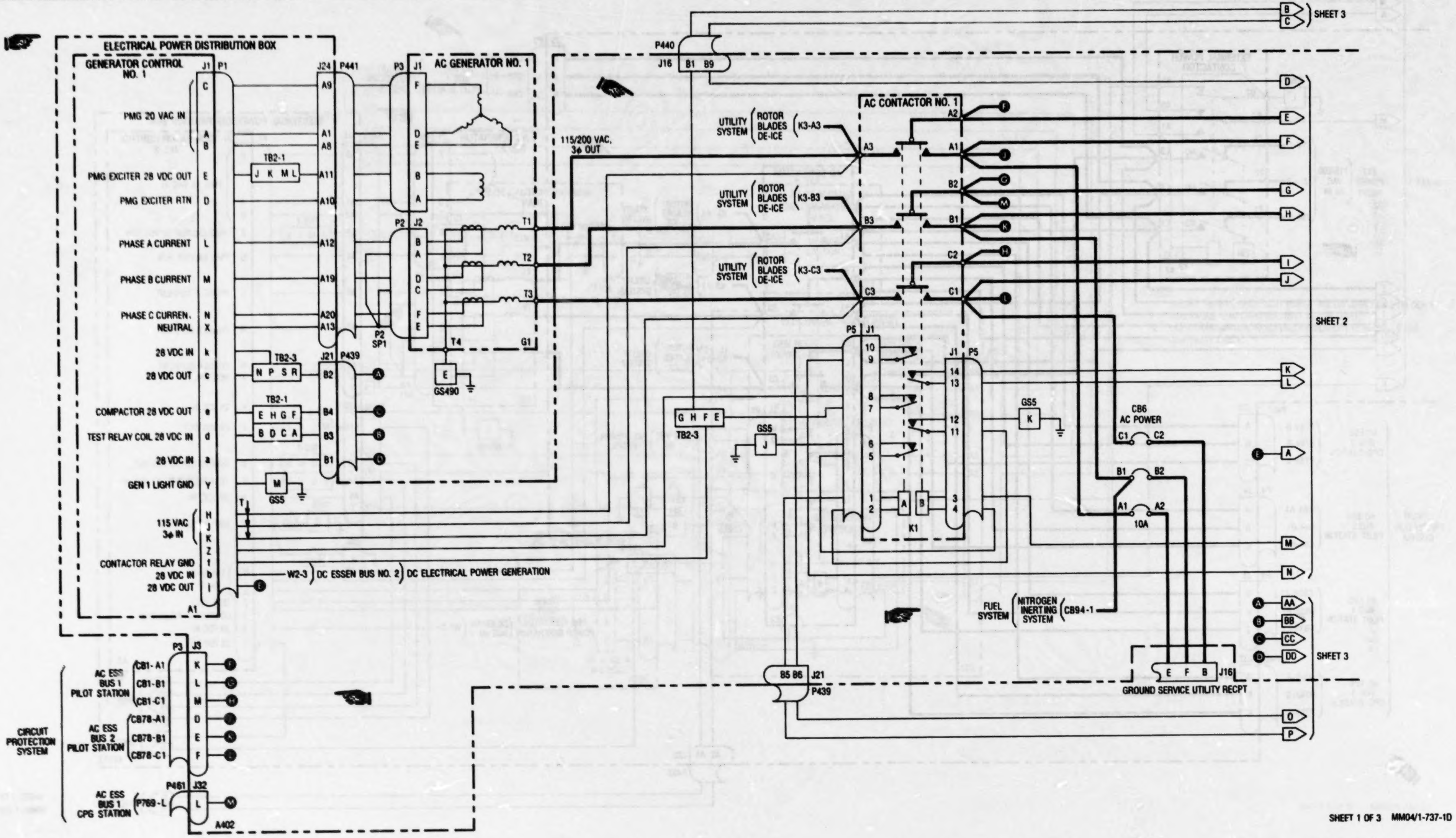

BTL DISCHARGE
APU
PRI DISCH
RES DISCH
FIRE
APU
PULL
FIRE BTL
PRI
RES
FIRE TEST
DET
2
1
OFF
START SWITCH
START
RUN
OFF
95%
NORM

Ⓑ BTL DISCHARGE / APU PANEL

MM04/1-1339

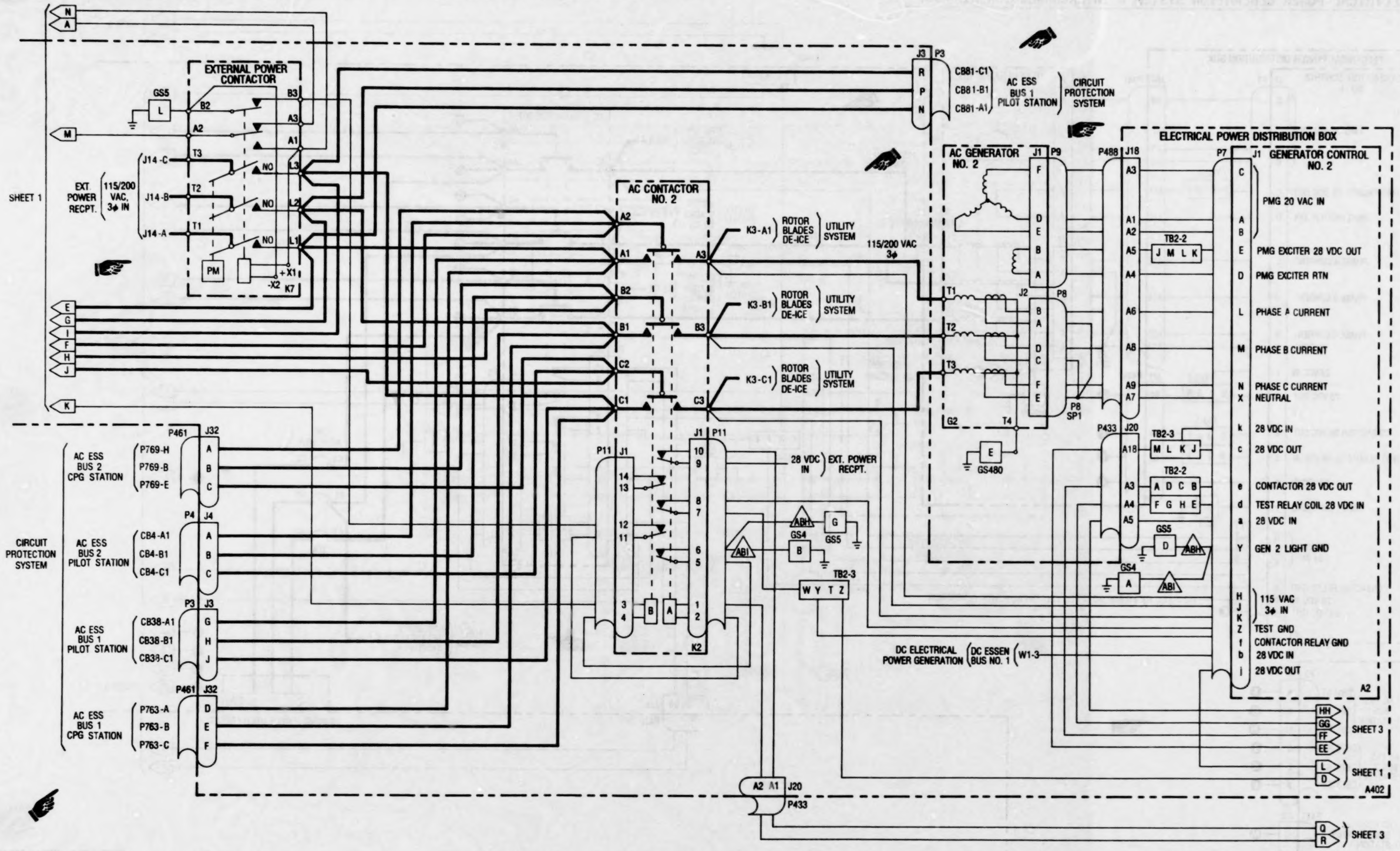
END OF TASK

9-2-5. AC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM


ELECTRICAL POWER DISTRIBUTION BOX
GENERATOR CONTROL NO. 1
J1 P1
PMG 20 VAC IN
PMG EXCITER 28 VDC OUT
PMG EXCITER RTN
PHASE A CURRENT
PHASE B CURRENT
PHASE C CURREN.
NEUTRAL
28 VDC IN
28 VDC OUT
COMPACTOR 28 VDC OUT
TEST RELAY COIL 28 VDC IN
28 VDC IN
GEN 1 LIGHT GND
115 VAC 3φ IN
CONTACTOR RELAY GND
28 VDC IN
28 VDC OUT
A1
TB2-1
J K M L
TB2-3
N P S R
E H G F
B D C A
GS5
J24 P441
J21 P439
P3 J1
P2 J2
P2 SP1
AC GENERATOR NO. 1
T1 T2 T3 T4 G1
GS490
115/200 VAC, 3φ OUT
W2-3 DC ESSEN BUS NO. 2 DC ELECTRICAL POWER GENERATION
P440
J16 B1 B9
SHEET 3
AC CONTACTOR NO. 1
UTILITY SYSTEM
ROTOR BLADES DE-ICE
K3-A3
K3-B3
K3-C3
A2 A1 A3 B2 B1 B3 C2 C1 C3
P5 J1
J1 P5
K1
TB2-3
G H F E
GS5
SHEET 2
CB6 AC POWER
C1 C2 B1 B2 A1 A2
10A
FUEL SYSTEM
NITROGEN INERTING SYSTEM
CB94-1
AA BB CC DD
B5 B6 J21
P439
E F B J16
GROUND SERVICE UTILITY RECPT
CIRCUIT PROTECTION SYSTEM
AC ESS BUS 1 PILOT STATION
CB1-A1
CB1-B1
CB1-C1
AC ESS BUS 2 PILOT STATION
CB78-A1
CB78-B1
CB78-C1
AC ESS BUS 1 CPG STATION
P769-L
P3 J3
P461 J32
A402

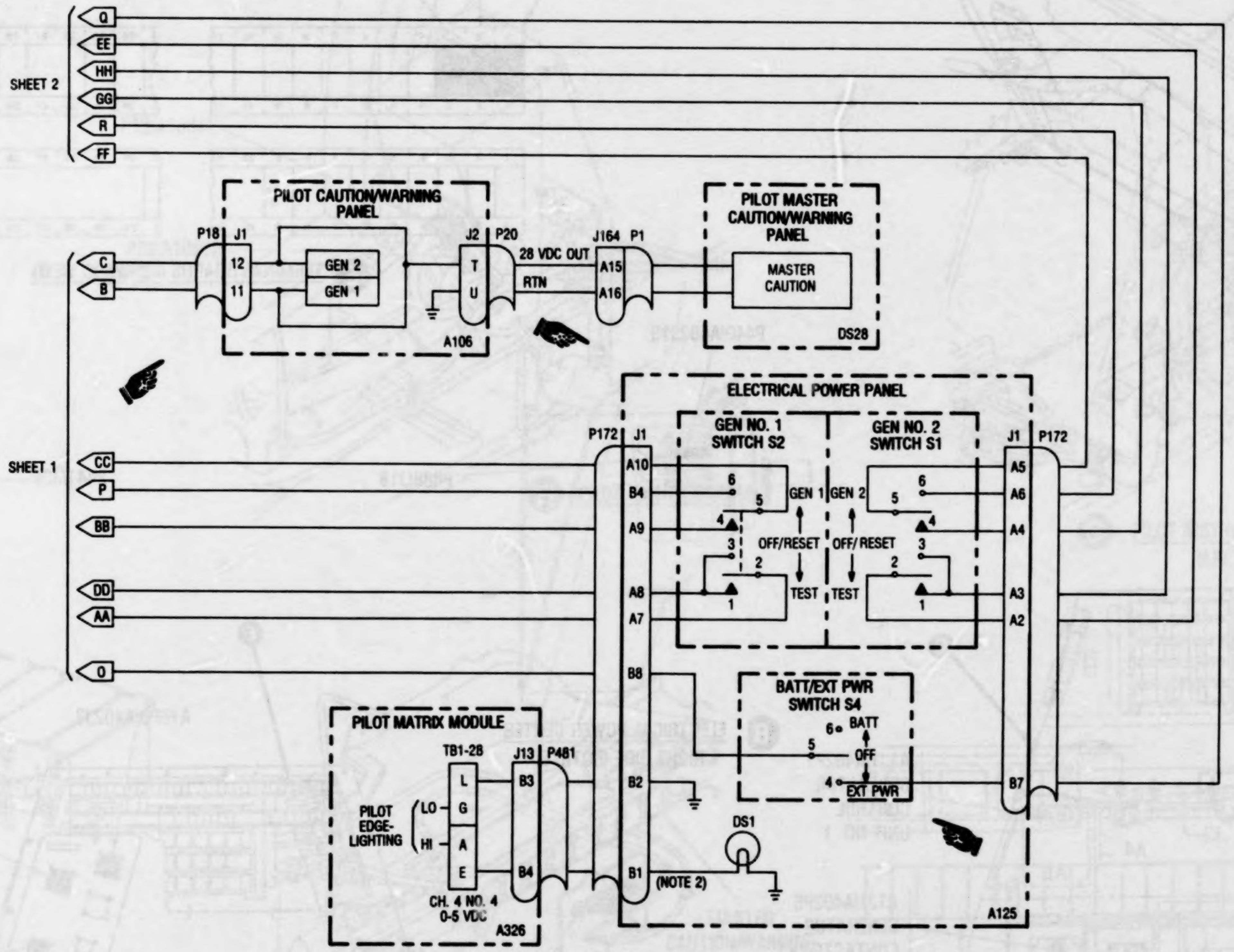
SHEET 1 OF 3 MM04/1-737-1D

9-2-5. AC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM (cont)


N
A
M
E
G
I
F
H
J
K
SHEET 1
EXT. POWER RECPT.
115/200 VAC, 3ϕ IN
J14-C
J14-B
J14-A
EXTERNAL POWER CONTACTOR
GS5
L
B2
A2
T3
T2
T1
B3
A3
A1
L3
L2
L1
NO
PM
+X1
-X2
K7
AC CONTACTOR NO. 2
A2
A1
B2
B1
C2
C1
A3
B3
C3
K3-A1
K3-B1
K3-C1
ROTOR BLADES DE-ICE
UTILITY SYSTEM
115/200 VAC 3ϕ
J3
P3
R
P
N
CB81-C1
CB81-B1
CB81-A1
AC ESS BUS 1 PILOT STATION
CIRCUIT PROTECTION SYSTEM
AC GENERATOR NO. 2
J1
P9
F
D
E
B
A
T1
T2
T3
J2
P8
C
G2
T4
P8
SP1
E
GS480
P488
J18
A3
A1
A2
A5
A4
A6
A8
A9
A7
TB2-2
J M L K
ELECTRICAL POWER DISTRIBUTION BOX
P7
J1
GENERATOR CONTROL NO. 2
PMG 20 VAC IN
PMG EXCITER 28 VDC OUT
PMG EXCITER RTN
PHASE A CURRENT
PHASE B CURRENT
PHASE C CURRENT
NEUTRAL
28 VDC IN
28 VDC OUT
CONTACTOR 28 VDC OUT
TEST RELAY COIL 28 VDC IN
28 VDC IN
GEN 2 LIGHT GND
115 VAC 3ϕ IN
TEST GND
CONTACTOR RELAY GND
28 VDC IN
28 VDC OUT
C
A
B
E
D
L
M
N
X
k
c
e
d
a
Y
H
J
K
Z
f
b
j
A2
P433
J20
A18
TB2-3
M L K J
TB2-2
A D C B
F G H E
GS5
D
ABH
GS4
A
ABI
HH
GG
FF
EE
SHEET 3
L
D
SHEET 1
A402
Q
R
SHEET 3
P461
J32
AC ESS BUS 2 CPG STATION
P769-H
P769-B
P769-E
CIRCUIT PROTECTION SYSTEM
P4
J4
AC ESS BUS 2 PILOT STATION
CB4-A1
CB4-B1
CB4-C1
P3
J3
AC ESS BUS 1 PILOT STATION
CB38-A1
CB38-B1
CB38-C1
G
H
J
P461
J32
AC ESS BUS 1 CPG STATION
P763-A
P763-B
P763-C
D
E
F
P11
J1
J1
P11
14
13
12
11
3
4
10
9
8
7
6
5
1
2
K2
28 VDC IN
EXT. POWER RECPT.
ABH
G
GS4
GS5
ABI
B
TB2-3
W Y T Z
DC ELECTRICAL POWER GENERATION
DC ESSEN BUS NO. 1
W1-3
A2
A1
J20
P433

SHEET 2 OF 3
MM04/1-737-2D

9-2-5. AC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM (cont)

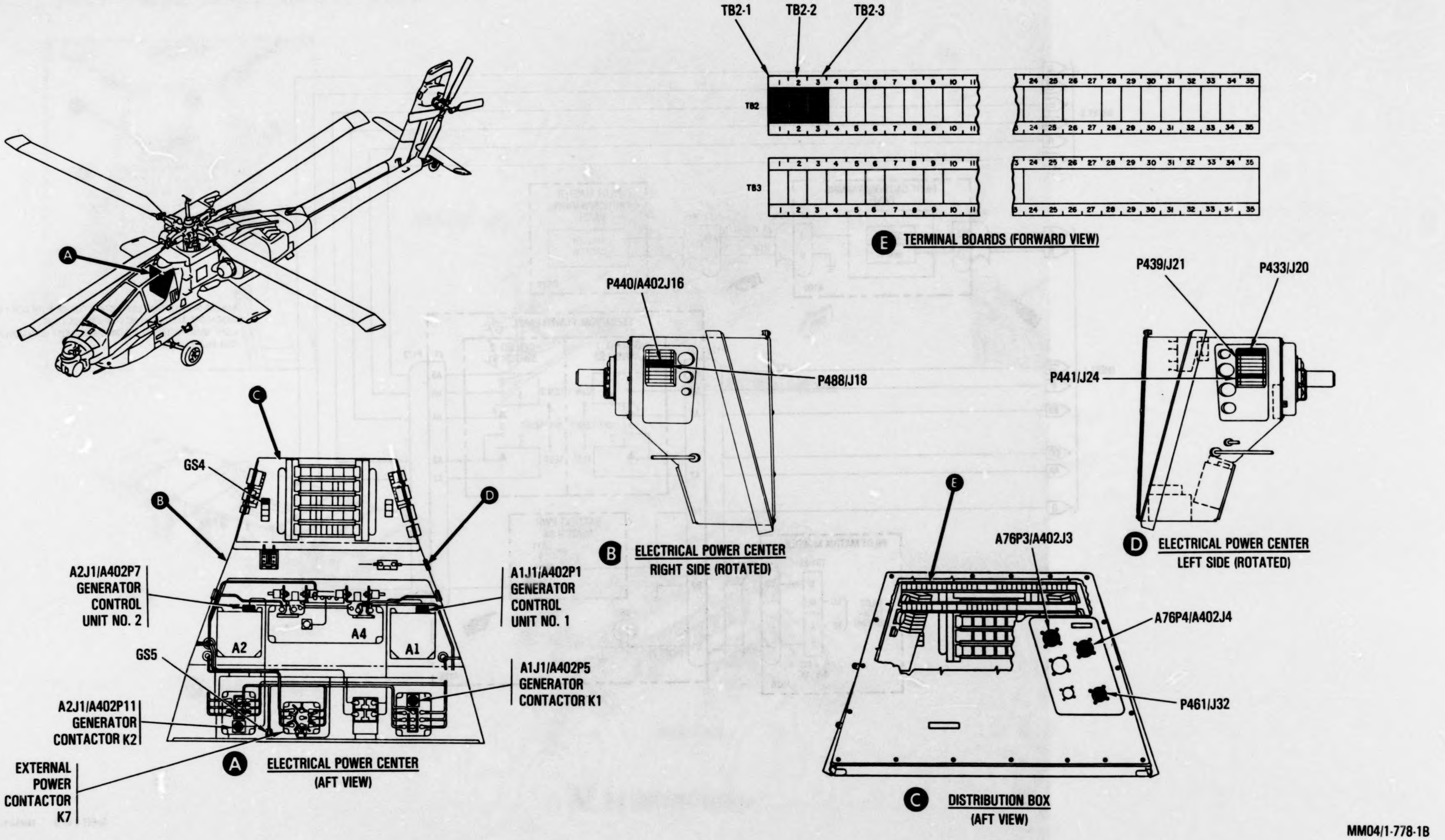

SHEET 2
Q
EE
HH
GG
R
FF
C
B
PILOT CAUTION/WARNING PANEL
P18
J1
12
11
GEN 2
GEN 1
J2
P20
T
U
A106
28 VDC OUT
RTN
J164
P1
A15
A16
PILOT MASTER CAUTION/WARNING PANEL
MASTER CAUTION
DS28
ELECTRICAL POWER PANEL
P172
J1
GEN NO. 1 SWITCH S2
GEN NO. 2 SWITCH S1
SHEET 1
CC
P
BB
DD
AA
O
A10
B4
A9
A8
A7
B8
B2
B1
6
5
4
3
2
1
GEN 1
GEN 2
OFF/RESET
TEST
A5
A6
A4
A3
A2
B7
BATT/EXT PWR SWITCH S4
BATT
OFF
EXT PWR
DS1
(NOTE 2)
A125
PILOT MATRIX MODULE
TB1-28
J13
P481
L
G
A
E
B3
B4
PILOT EDGE-LIGHTING
LO
HI
CH. 4 NO. 4
0-5 VDC
A326

NOTE:

1. FAILURE SIGNALS THAT LIGHT EITHER ONE OR BOTH GEN 1 OR GEN 2 INDICATORS ALSO LIGHT MASTER CAUTION LIGHT.
2. LIGHT TRANSMITTING INDICATING PANEL MUST BE REMOVED FOR CONTINUITY CHECK.

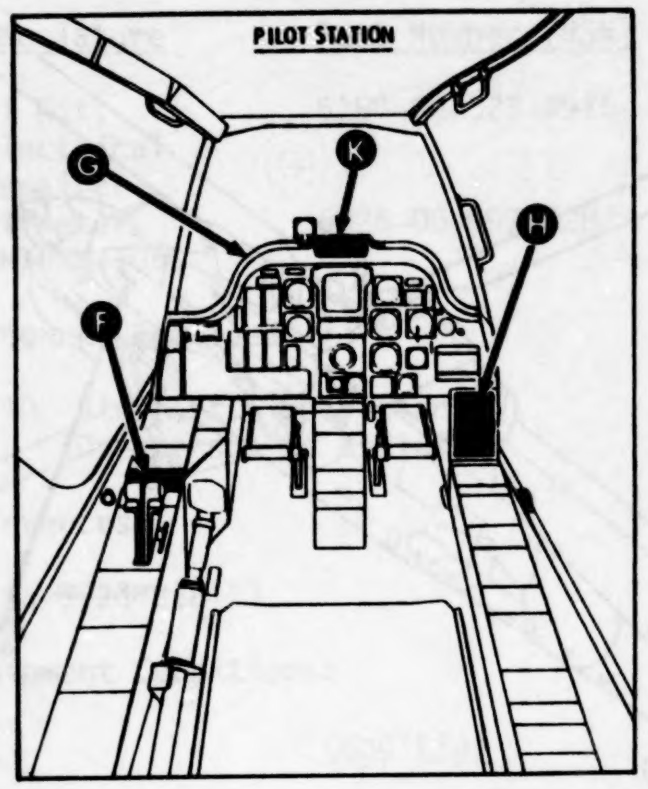
SHEET 3 OF 3 MM04/1-737-30

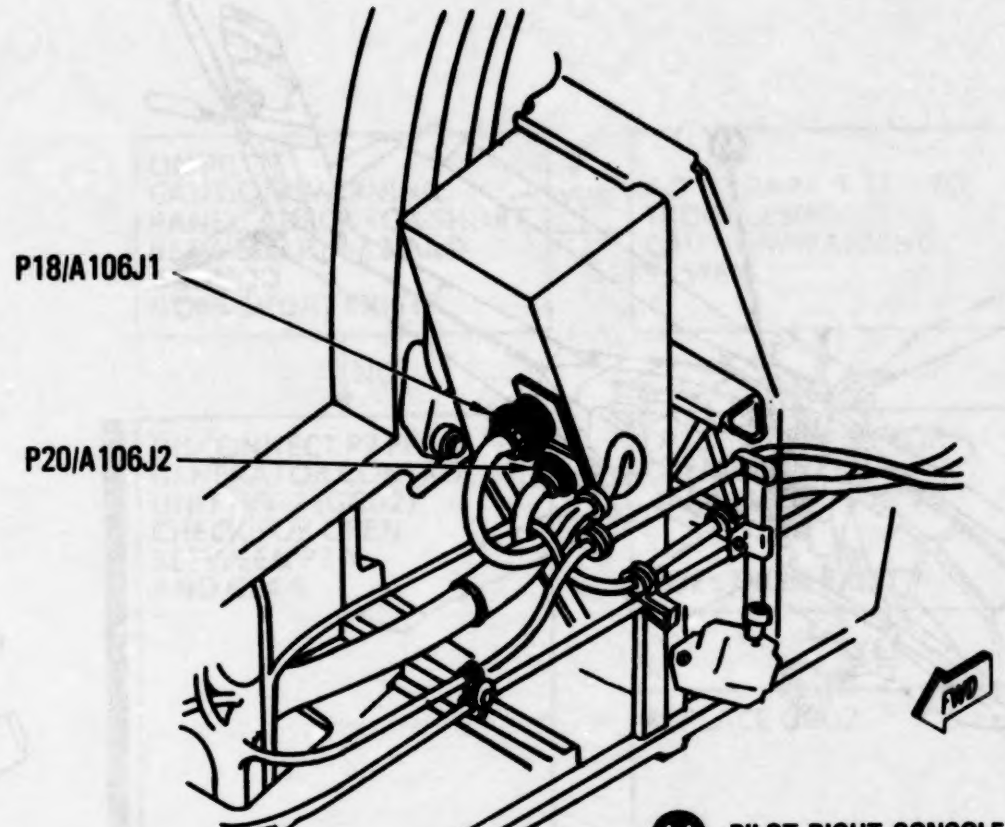
9-2-6. AC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


TB2-1
TB2-2
TB2-3
TB2
TB3
1 2 3 4 5 6 7 8 9 10 11
24 25 26 27 28 29 30 31 32 33 34 35
E TERMINAL BOARDS (FORWARD VIEW)
A
P440/A402J16
P488/J18
B ELECTRICAL POWER CENTER RIGHT SIDE (ROTATED)
P439/J21
P433/J20
P441/J24
D ELECTRICAL POWER CENTER LEFT SIDE (ROTATED)
C
GS4
B
D
A2J1/A402P7 GENERATOR CONTROL UNIT NO. 2
A1J1/A402P1 GENERATOR CONTROL UNIT NO. 1
A4
A2
A1
GS5
A1J1/A402P5 GENERATOR CONTACTOR K1
A2J1/A402P11 GENERATOR CONTACTOR K2
EXTERNAL POWER CONTACTOR K7
A ELECTRICAL POWER CENTER (AFT VIEW)
E
A76P3/A402J3
A76P4/A402J4
P461/J32
C DISTRIBUTION BOX (AFT VIEW)

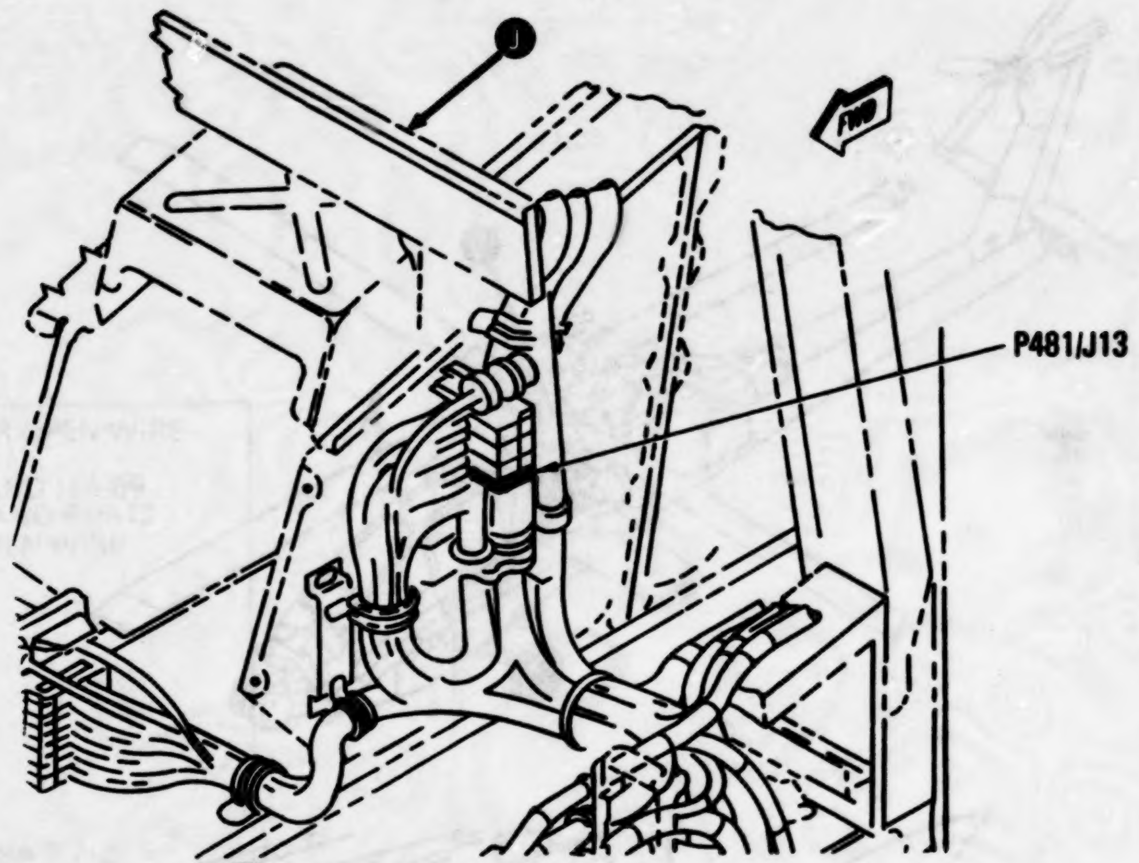
MM04/1-778-1B

9-2-6. AC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

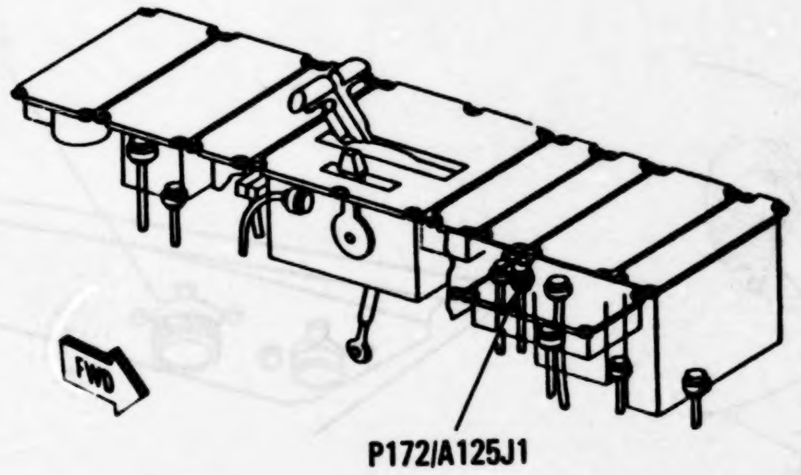

PILOT STATION
G
K
H
F


P18/A106J1
P20/A106J2
FWD

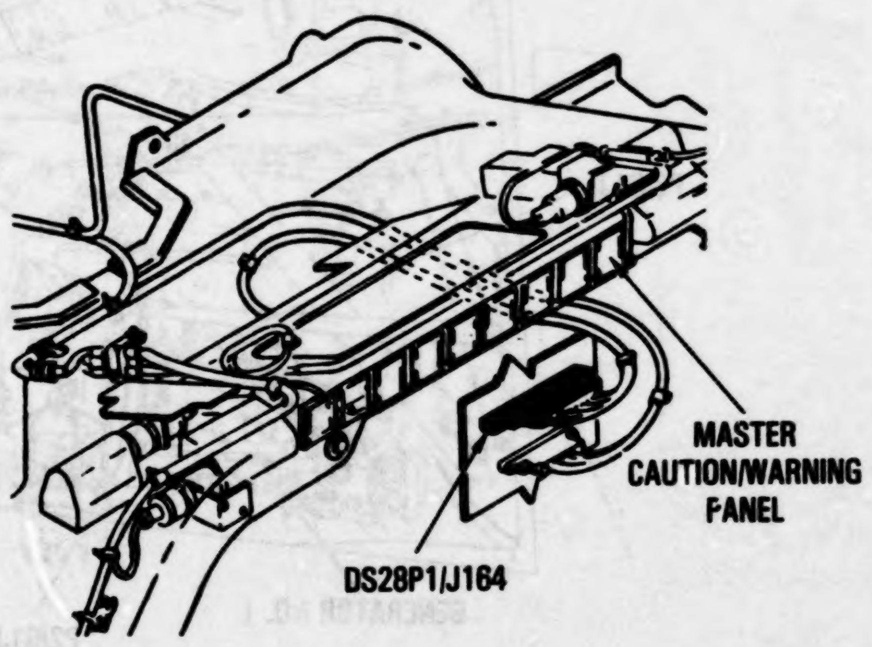
Ⓗ PILOT RIGHT CONSOLE


J
FWD
P481/J13

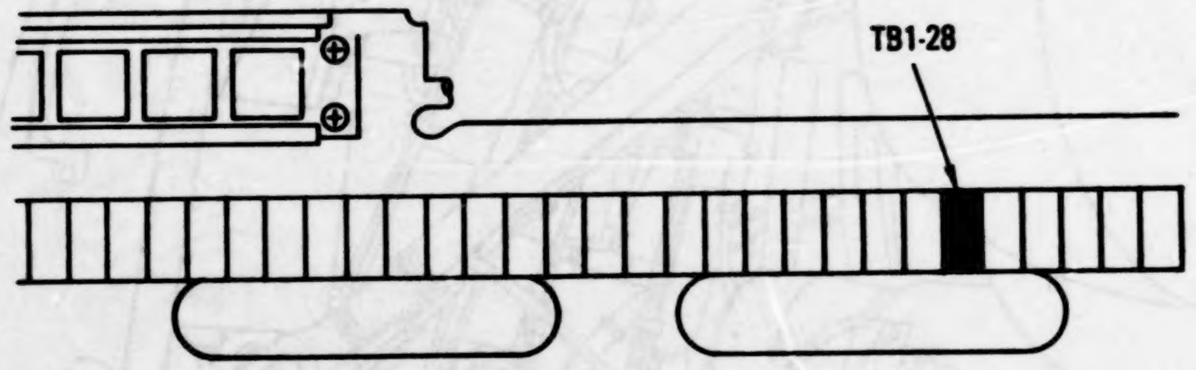
Ⓖ PILOT INSTRUMENT PANEL
(AFT VIEW)


FWD
P172/A125J1

Ⓕ PILOT LEFT CONSOLE


MASTER CAUTION/WARNING PANEL
DS28P1/J164

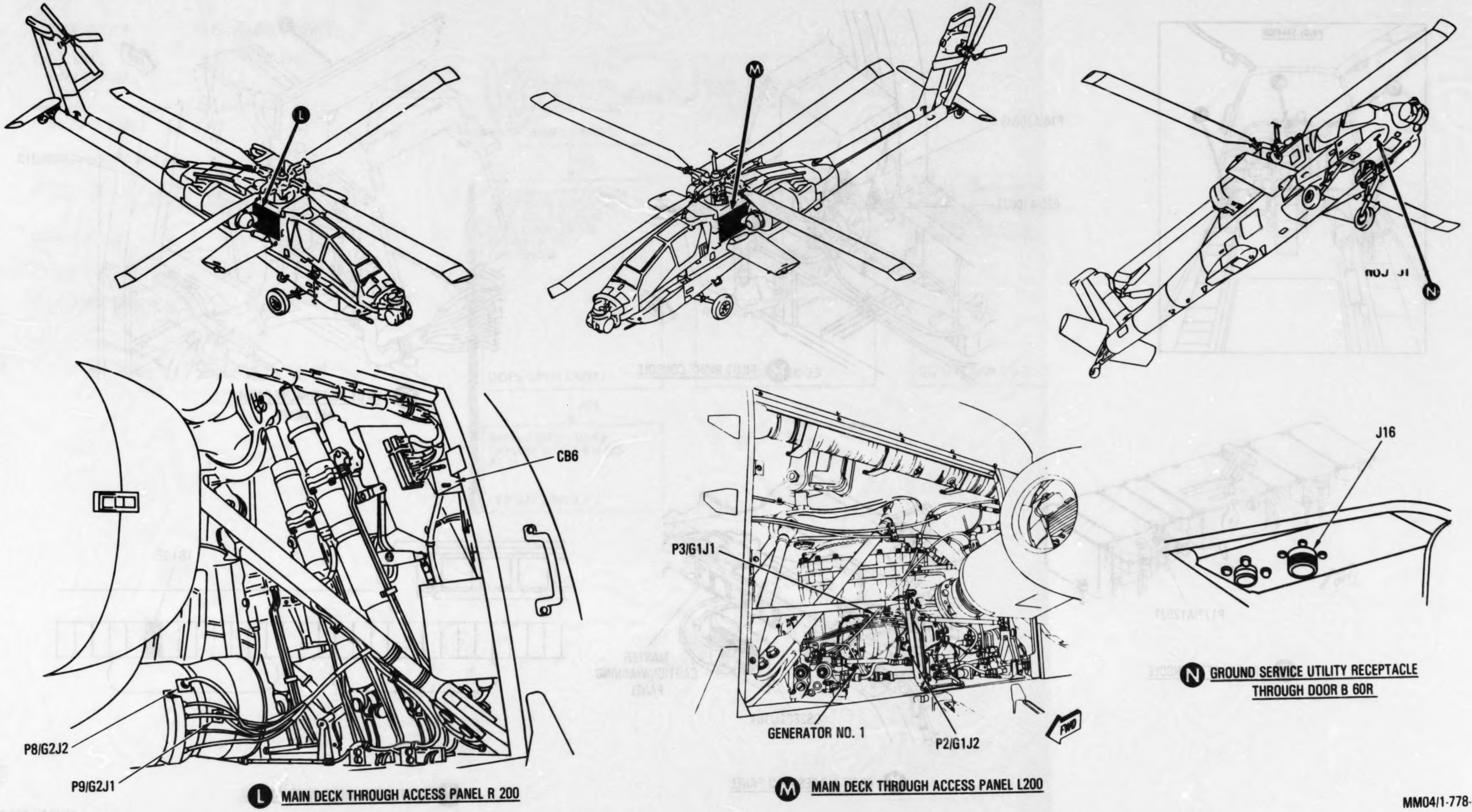
Ⓚ PILOT GLARESHIELD PANEL



Ⓙ PILOT INSTRUMENT PANEL MATRIX

MM04/1-778-2B

9-2-6. AC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


L
M
N
CB6
P8/G2J2
P9/G2J1
P3/G1J1
GENERATOR NO. 1
P2/G1J2
FWD
J16
MM04/1-778-3B

Ⓛ MAIN DECK THROUGH ACCESS PANEL R 200

Ⓜ MAIN DECK THROUGH ACCESS PANEL L200

Ⓝ GROUND SERVICE UTILITY RECEPTACLE THROUGH DOOR B 60R

9-2-7. GEN 2 INDICATOR IS NOT LIGHTED WITH GENERATOR NO. 2 OFF LINE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

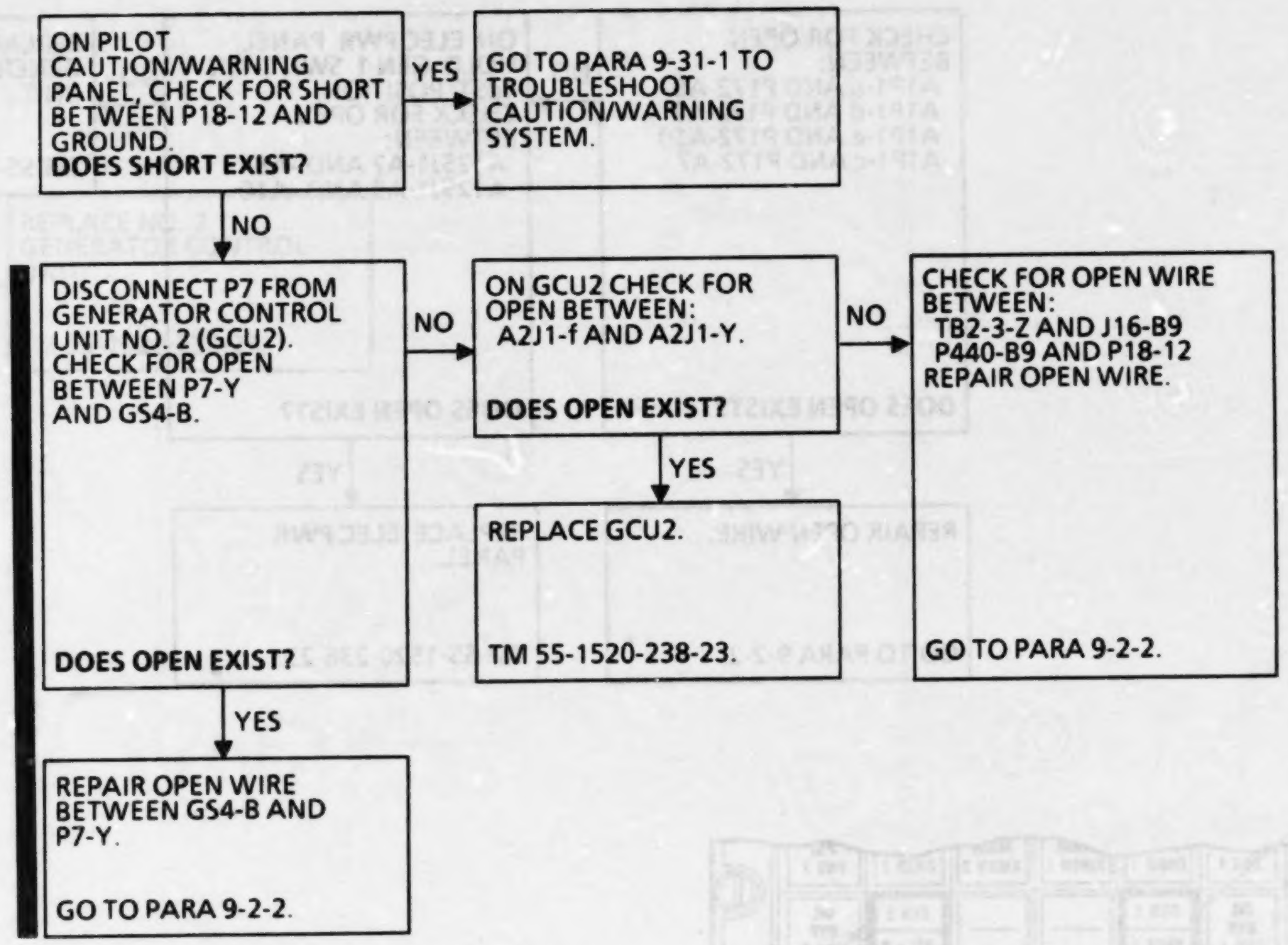
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



ON PILOT CAUTION/WARNING PANEL, CHECK FOR SHORT BETWEEN P18-12 AND GROUND.
DOES SHORT EXIST?

GO TO PARA 9-31-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

DISCONNECT P7 FROM GENERATOR CONTROL UNIT NO. 2 (GCU2). CHECK FOR OPEN BETWEEN P7-Y AND GS4-B.
DOES OPEN EXIST?

ON GCU2 CHECK FOR OPEN BETWEEN:
A2J1-f AND A2J1-Y.
DOES OPEN EXIST?

CHECK FOR OPEN WIRE BETWEEN:
TB2-3-Z AND J16-B9
P440-B9 AND P18-12
REPAIR OPEN WIRE.
GO TO PARA 9-2-2.

REPLACE GCU2.
TM 55-1520-238-23.

REPAIR OPEN WIRE BETWEEN GS4-B AND P7-Y.
GO TO PARA 9-2-2.

END OF TASK

9-2-8. GEN 1 INDICATOR IS LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

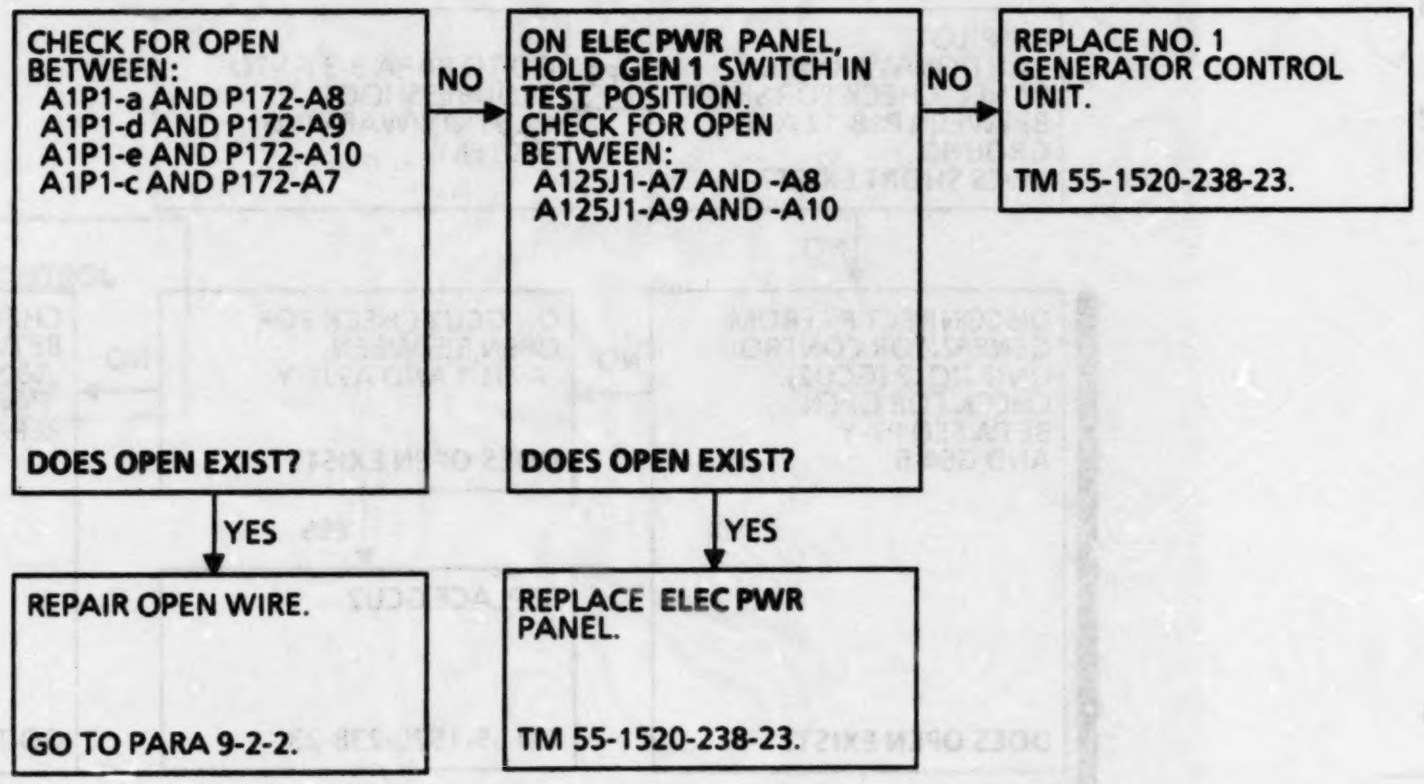
68F10 Aircraft Electrician
One person to assist

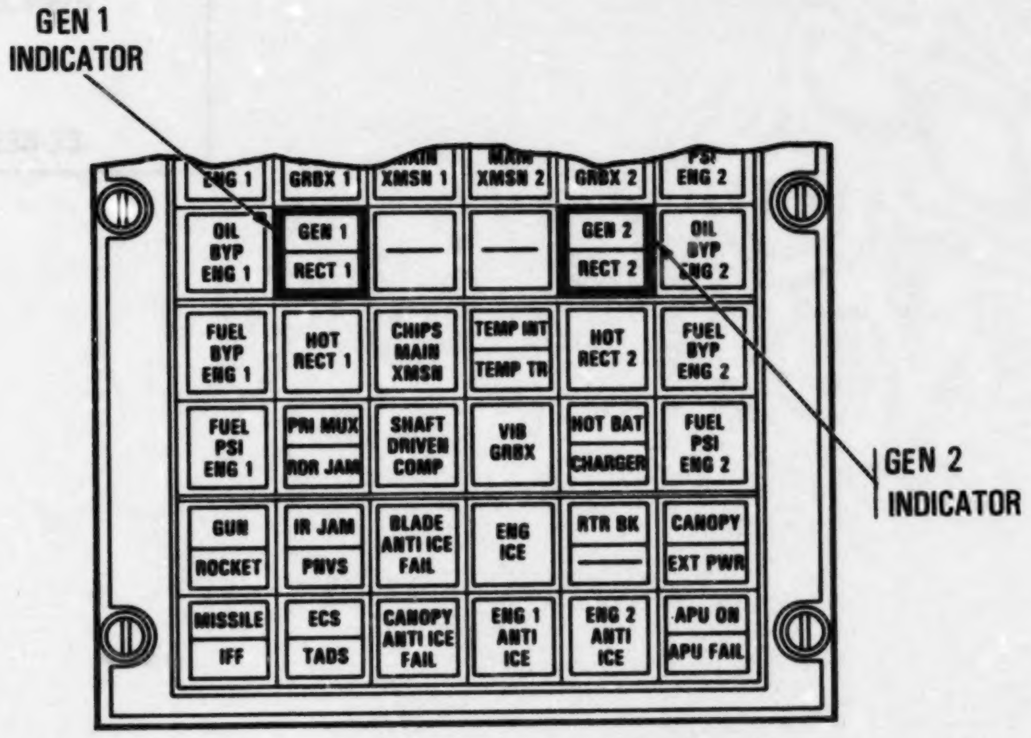
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed


CHECK FOR OPEN BETWEEN:
A1P1-a AND P172-A8
A1P1-d AND P172-A9
A1P1-e AND P172-A10
A1P1-c AND P172-A7
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-2-2.
ON ELEC PWR PANEL, HOLD GEN 1 SWITCH IN TEST POSITION. CHECK FOR OPEN BETWEEN:
A125J1-A7 AND -A8
A125J1-A9 AND -A10
DOES OPEN EXIST?
NO
YES
REPLACE ELEC PWR PANEL.
TM 55-1520-238-23.
REPLACE NO. 1 GENERATOR CONTROL UNIT.
TM 55-1520-238-23.


GEN 1 INDICATOR
GEN 2 INDICATOR
ENG 1
GRBX 1
MAIN XMSN 1
MAIN XMSN 2
GRBX 2
PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

PILOT CAUTION/WARNING PANEL

MM04/1-799A

END OF TASK

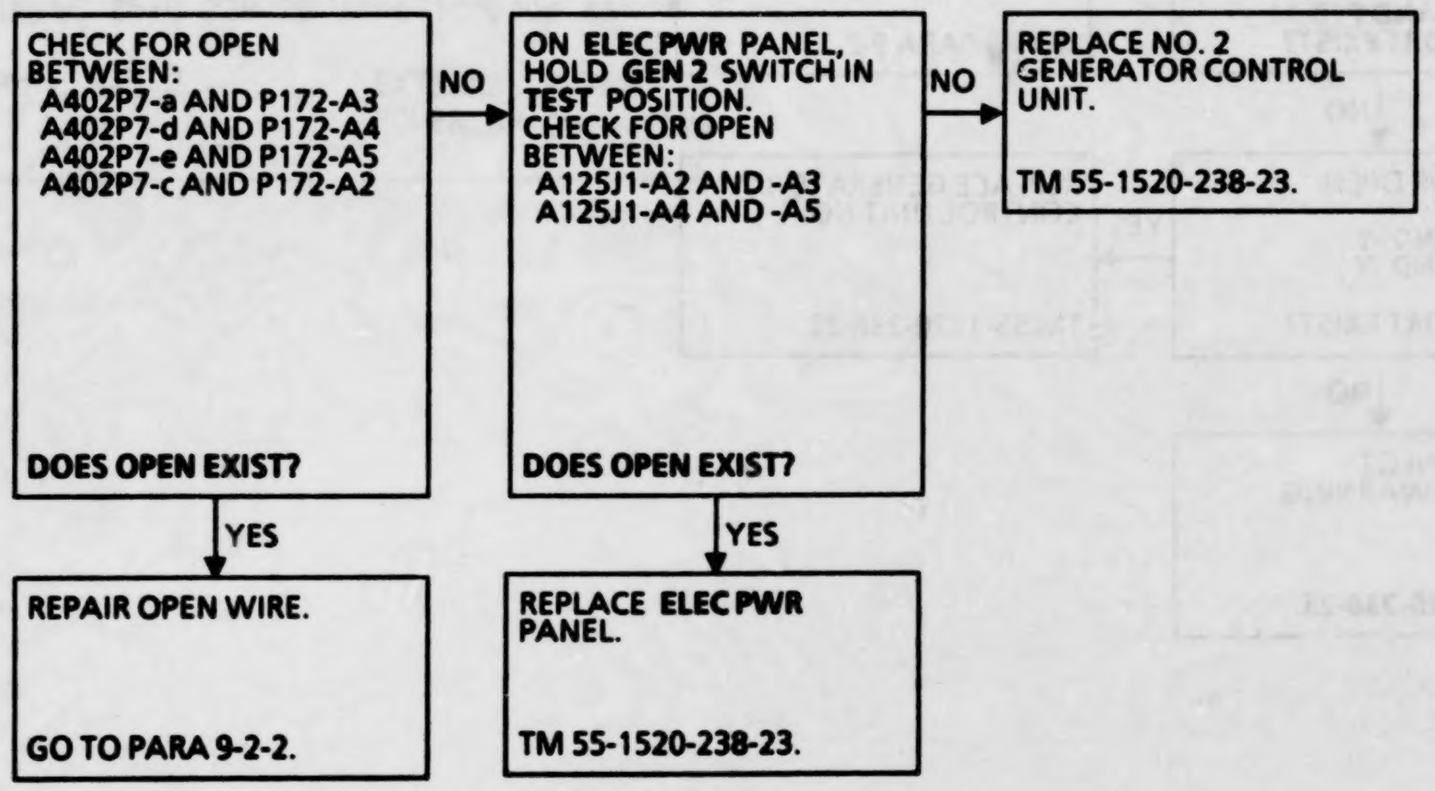
9-2-9. GEN 2 INDICATOR IS LIGHTED

Tools: (para 9-2-8)

Personnel Required: (para 9-2-8)

References: (para 9-2-8)

Equipment Conditions: (para 9-2-8)


CHECK FOR OPEN BETWEEN:
A402P7-a AND P172-A3
A402P7-d AND P172-A4
A402P7-e AND P172-A5
A402P7-c AND P172-A2
DOES OPEN EXIST?
NO
ON ELEC PWR PANEL, HOLD GEN 2 SWITCH IN TEST POSITION. CHECK FOR OPEN BETWEEN:
A125J1-A2 AND -A3
A125J1-A4 AND -A5
DOES OPEN EXIST?
NO
REPLACE NO. 2 GENERATOR CONTROL UNIT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-2-2.
YES
REPLACE ELEC PWR PANEL.
TM 55-1520-238-23.

END OF TASK

9-2-10. GEN 1 INDICATOR IS NOT LIGHTED WITH GENERATOR NO. 1 OFF LINE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital, AN/PSM-45	6625-01-139-2512

Personnel Required:

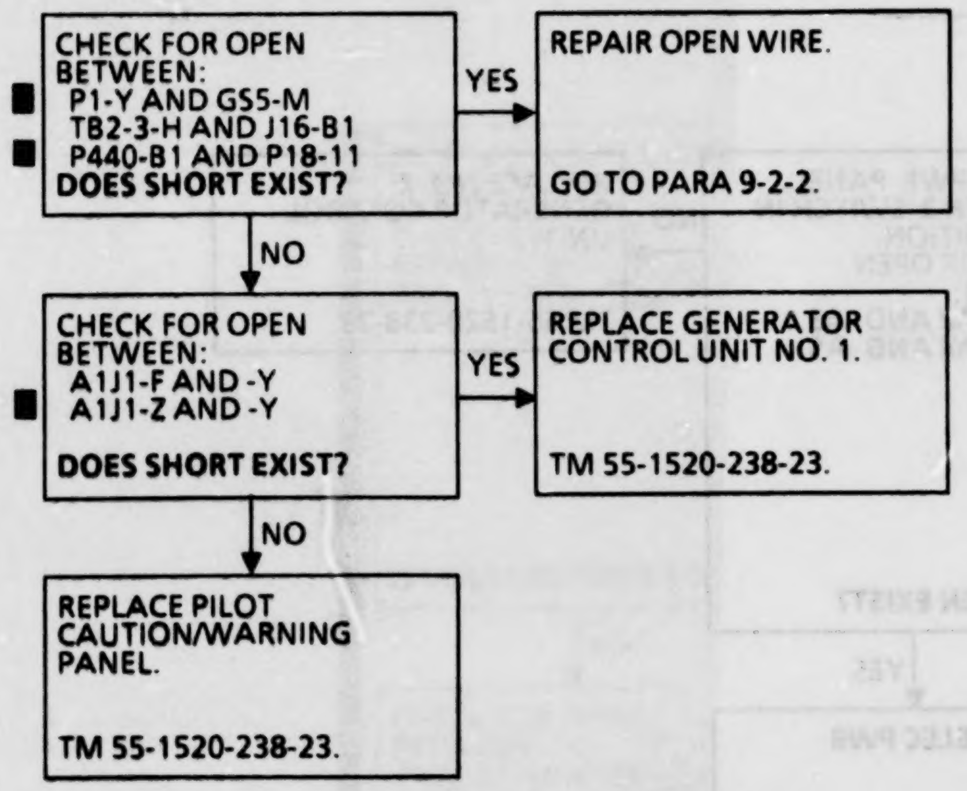
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Access provisions - electrical power distribution box cover removed



CHECK FOR OPEN BETWEEN:
P1-Y AND GS5-M
TB2-3-H AND J16-B1
P440-B1 AND P18-11
DOES SHORT EXIST?

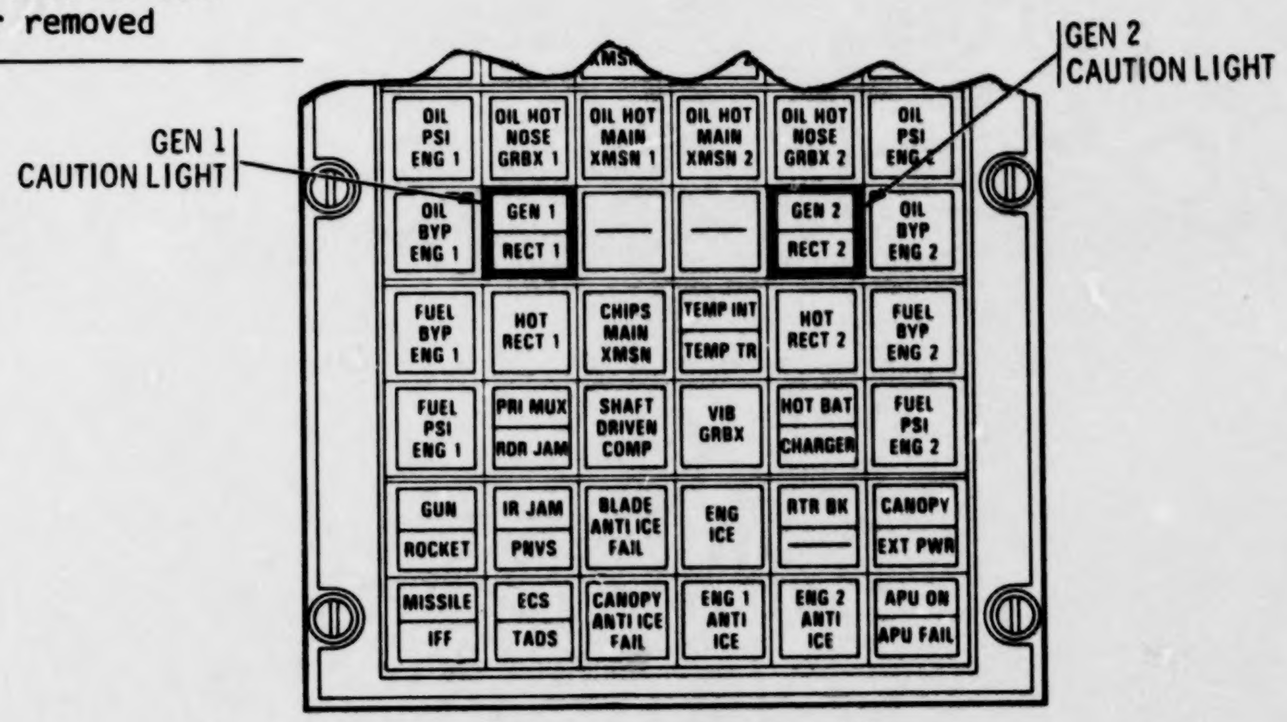
REPAIR OPEN WIRE.
GO TO PARA 9-2-2.

CHECK FOR OPEN BETWEEN:
A1J1-F AND -Y
A1J1-Z AND -Y
DOES SHORT EXIST?

REPLACE GENERATOR CONTROL UNIT NO. 1.
TM 55-1520-238-23.

REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.

YES
NO
YES
NO



GEN 1 CAUTION LIGHT
GEN 2 CAUTION LIGHT
XMSN
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

PILOT CAUTION / WARNING PANEL

MM04/1-802A

END OF TASK

9-2-11. ELEC PWR PANEL EDGE-LIGHT DOES NOT LIGHT

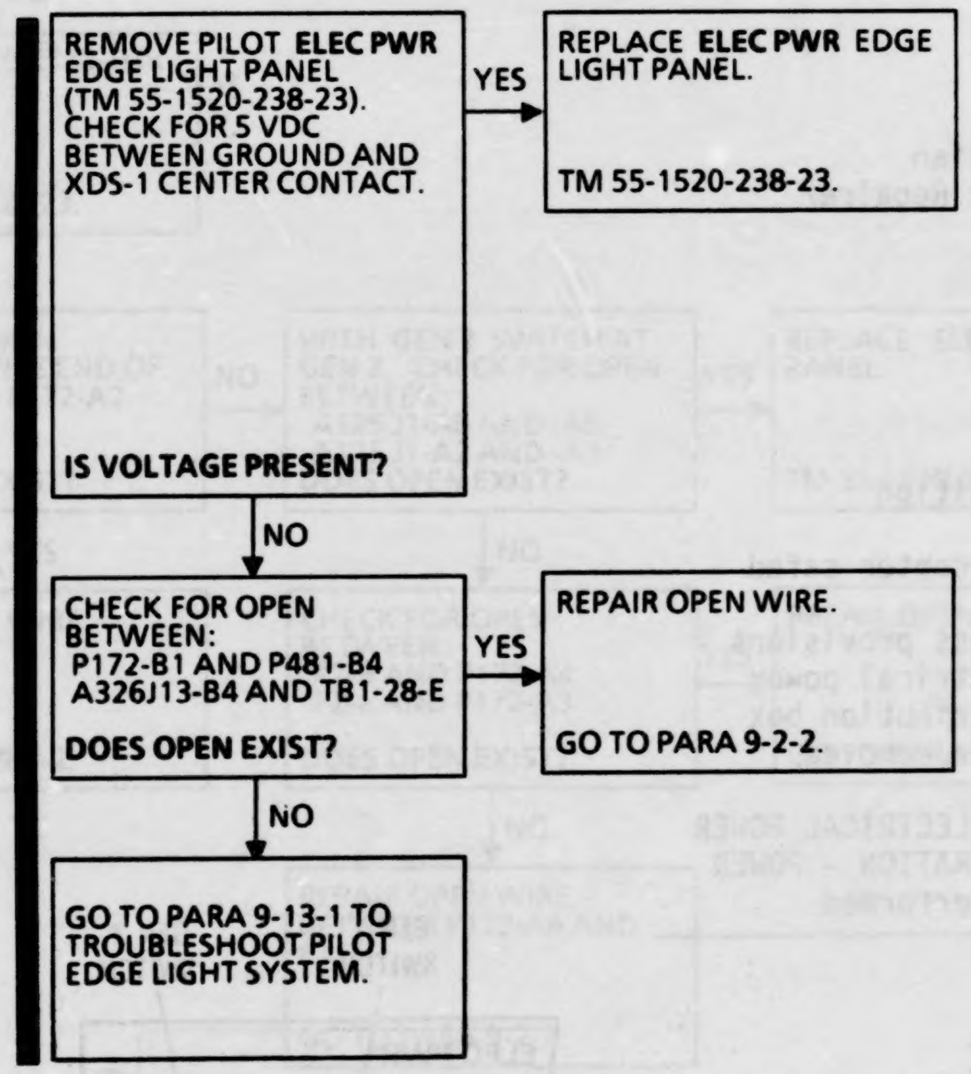
Tools: (para 9-2-10)

Personnel Required: (para 9-2-10)

References: (para 9-2-10)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed



REMOVE PILOT ELEC PWR EDGE LIGHT PANEL (TM 55-1520-238-23). CHECK FOR 5 VDC BETWEEN GROUND AND XDS-1 CENTER CONTACT.

IS VOLTAGE PRESENT?

YES: REPLACE ELEC PWR EDGE LIGHT PANEL.

TM 55-1520-238-23.

NO: CHECK FOR OPEN BETWEEN:
P172-B1 AND P481-B4
A326J13-B4 AND TB1-28-E

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE.

GO TO PARA 9-2-2.

NO: GO TO PARA 9-13-1 TO TROUBLESHOOT PILOT EDGE LIGHT SYSTEM.

END OF TASK

9-2-12. GEN 1 INDICATOR IS NOT LIGHTED WITH GENERATOR NO. 1 OFF LINE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
67R10 Attack Helicopter Repairer

References:

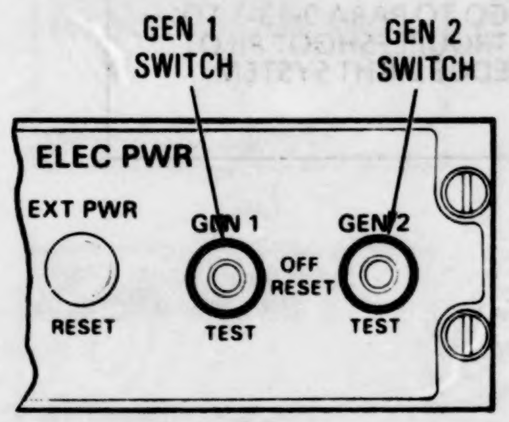
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - electrical power distribution box cover removed
Para 9-2-3	AC ELECTRICAL POWER GENERATION - POWER UP performed

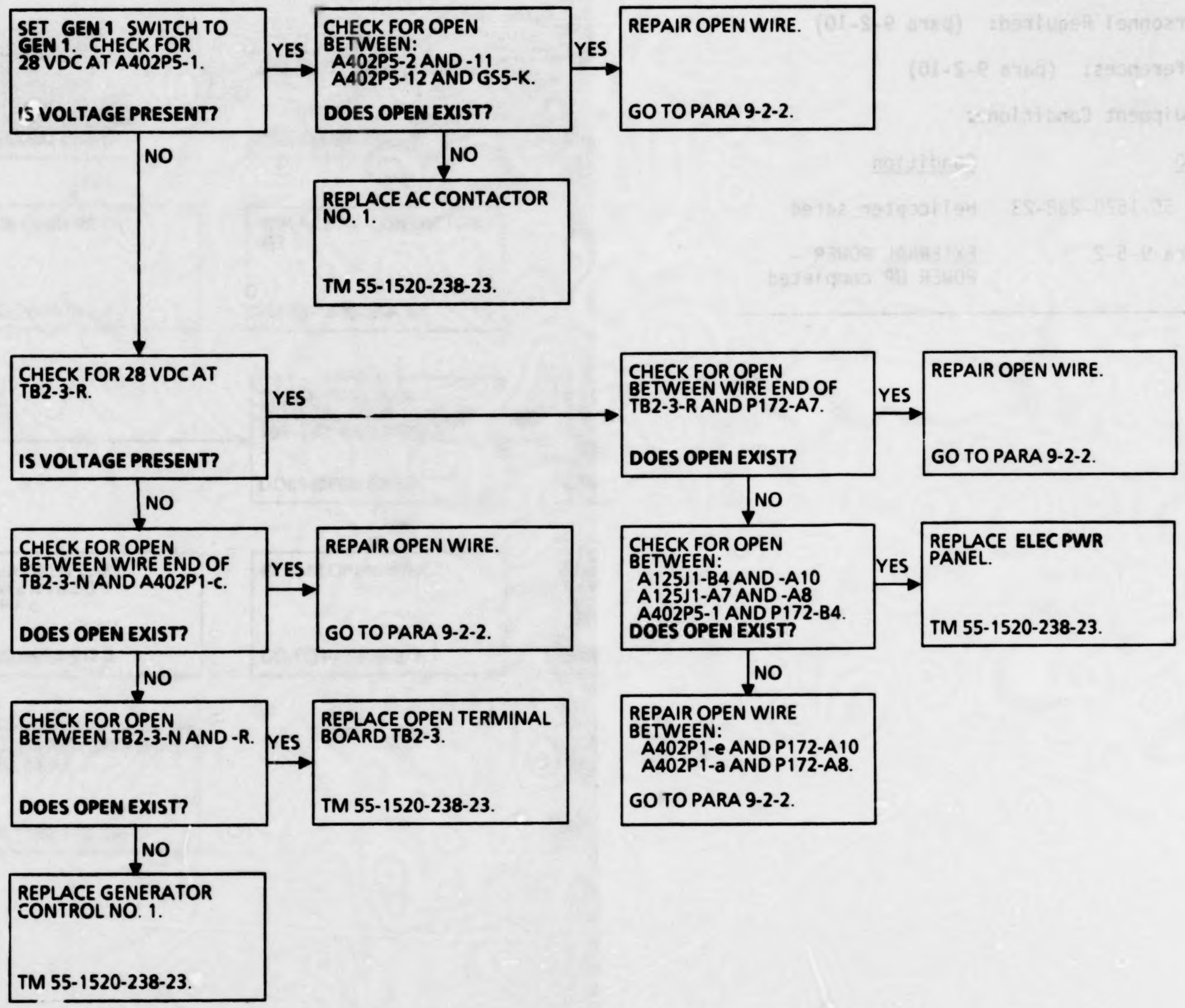
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


GEN 1 SWITCH
GEN 2 SWITCH
ELEC PWR
EXT PWR
RESET
GEN 1
OFF
RESET
TEST
GEN 2
TEST

ELEC PWR PANEL

MM04/1-920


SET GEN 1 SWITCH TO GEN 1. CHECK FOR 28 VDC AT A402P5-1.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: A402P5-2 AND -11 A402P5-12 AND GS5-K.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-2-2.
NO
REPLACE AC CONTACTOR NO. 1.
TM 55-1520-238-23.
NO
CHECK FOR 28 VDC AT TB2-3-R.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN WIRE END OF TB2-3-R AND P172-A7.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN: A125J1-B4 AND -A10 A125J1-A7 AND -A8 A402P5-1 AND P172-B4.
DOES OPEN EXIST?
YES
REPLACE ELEC PWR PANEL.
TM 55-1520-238-23.
NO
REPAIR OPEN WIRE BETWEEN: A402P1-e AND P172-A10 A402P1-a AND P172-A8.
GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN WIRE END OF TB2-3-N AND A402P1-c.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN TB2-3-N AND -R.
DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB2-3.
TM 55-1520-238-23.
NO
REPLACE GENERATOR CONTROL NO. 1.
TM 55-1520-238-23.

END OF TASK

9-2-13. WITH GEN 2 SWITCH IN GEN 2 POSITION - GEN 2 INDICATOR IS LIGHTED

Tools: (para 9-2-12)

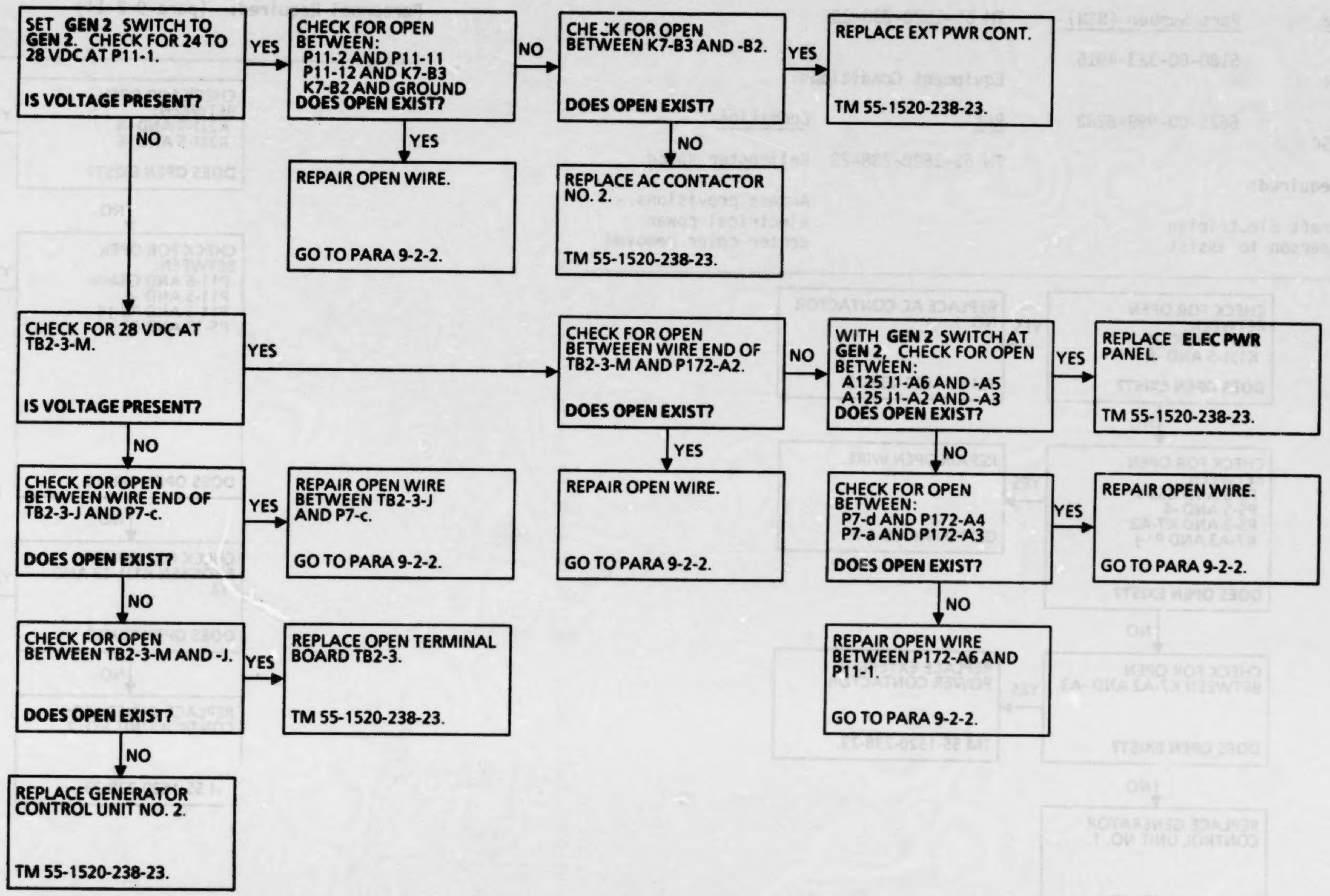
Personnel Required: (para 9-2-12)

References: (para 9-2-12)

Equipment Conditions: (para 9-2-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


SET GEN 2 SWITCH TO GEN 2. CHECK FOR 24 TO 28 VDC AT P11-1. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P11-2 AND P11-11 P11-12 AND K7-B3 K7-B2 AND GROUND DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN K7-B3 AND -B2. DOES OPEN EXIST?
YES
REPLACE EXT PWR CONT. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-2-2.
NO
REPLACE AC CONTACTOR NO. 2. TM 55-1520-238-23.
NO
CHECK FOR 28 VDC AT TB2-3-M. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEEN WIRE END OF TB2-3-M AND P172-A2. DOES OPEN EXIST?
NO
WITH GEN 2 SWITCH AT GEN 2, CHECK FOR OPEN BETWEEN: A125 J1-A6 AND -A5 A125 J1-A2 AND -A3 DOES OPEN EXIST?
YES
REPLACE ELEC PWR PANEL. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN: P7-d AND P172-A4 P7-a AND P172-A3 DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-2-2.
NO
REPAIR OPEN WIRE BETWEEN P172-A6 AND P11-1. GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN WIRE END OF TB2-3-J AND P7-c. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN TB2-3-J AND P7-c. GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN TB2-3-M AND -J. DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB2-3. TM 55-1520-238-23.
NO
REPLACE GENERATOR CONTROL UNIT NO. 2. TM 55-1520-238-23.

END OF TASK

9-2-14. RECT 1 INDICATOR - IS LIGHTED WITH GEN 1 SWITCH OFF

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

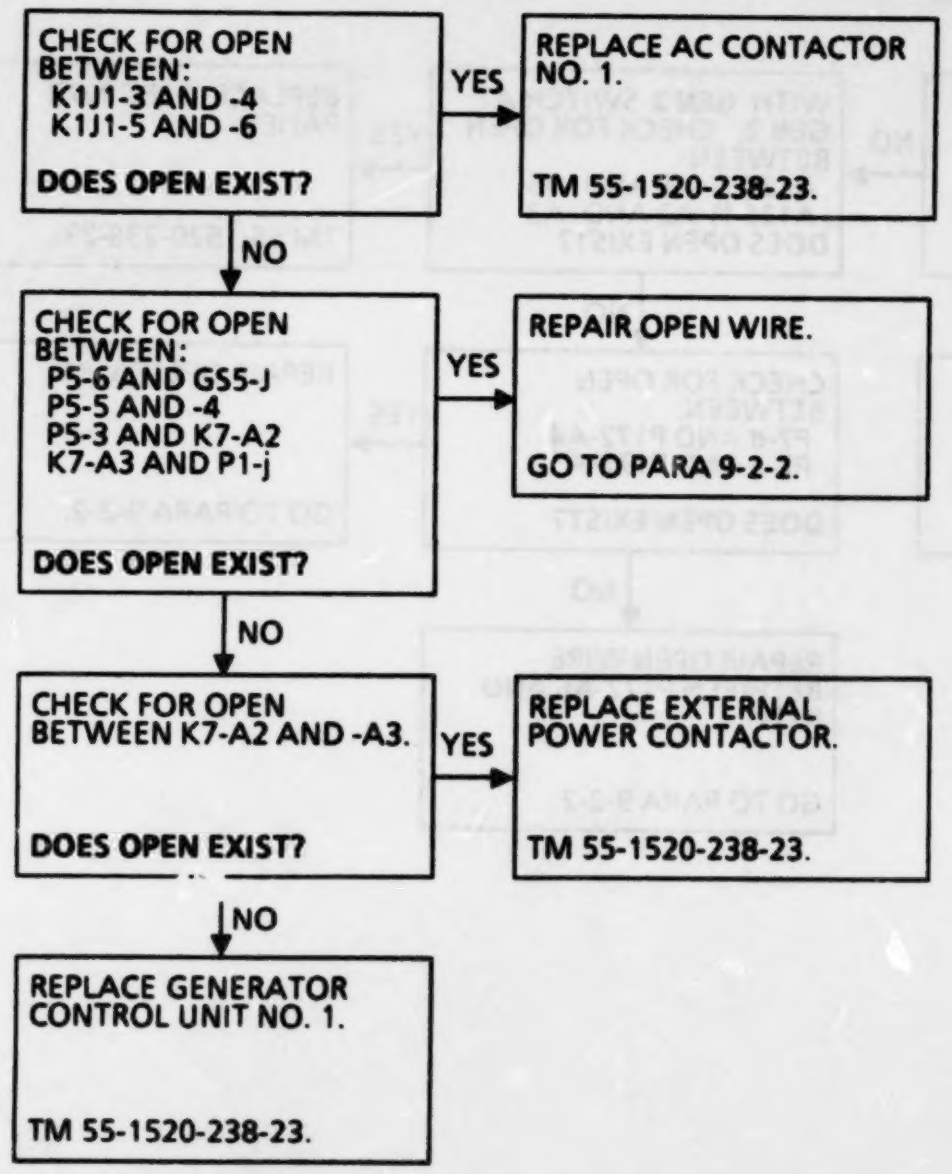
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Access provisions - electrical power center cover removed


CHECK FOR OPEN BETWEEN:
K1J1-3 AND -4
K1J1-5 AND -6
DOES OPEN EXIST?
YES
REPLACE AC CONTACTOR NO. 1.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN:
P5-6 AND GS5-J
P5-5 AND -4
P5-3 AND K7-A2
K7-A3 AND P1-j
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN K7-A2 AND -A3.
DOES OPEN EXIST?
YES
REPLACE EXTERNAL POWER CONTACTOR.
TM 55-1520-238-23.
NO
REPLACE GENERATOR CONTROL UNIT NO. 1.
TM 55-1520-238-23.

END OF TASK

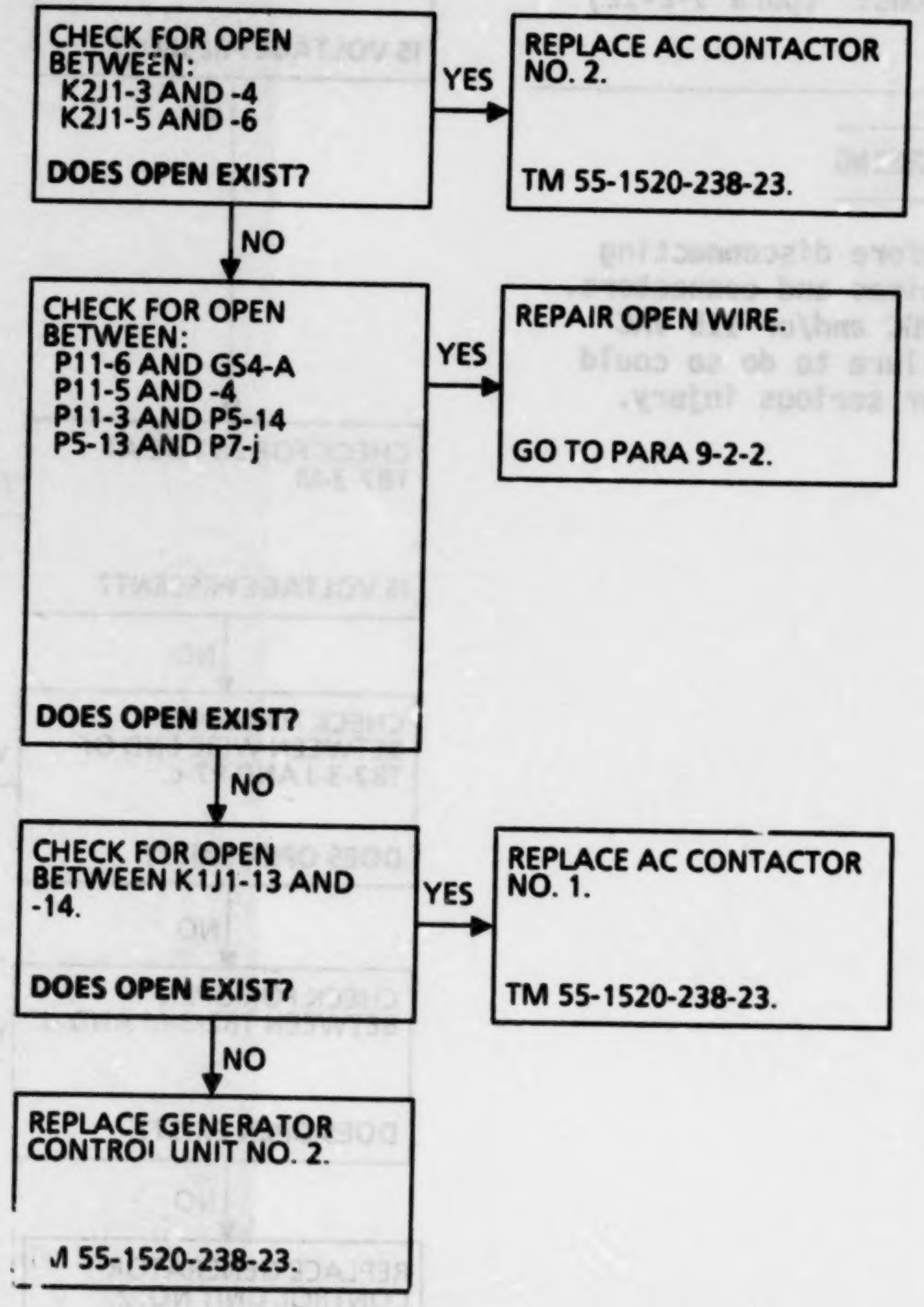
9-2-15. RECT 2 INDICATOR IS LIGHTED WITH GEN 2 SWITCH OFF AND GEN 1 SWITCH AT GEN 1

Tools: (para 9-2-14)

Personnel Required: (para 9-2-14)

References: (para 9-2-14)

Equipment Conditions: (para 9-2-14)


CHECK FOR OPEN BETWEEN:
K2J1-3 AND -4
K2J1-5 AND -6
DOES OPEN EXIST?
YES
REPLACE AC CONTACTOR NO. 2.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN:
P11-6 AND GS4-A
P11-5 AND -4
P11-3 AND P5-14
P5-13 AND P7-j
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN K1J1-13 AND -14.
DOES OPEN EXIST?
YES
REPLACE AC CONTACTOR NO. 1.
TM 55-1520-238-23.
NO
REPLACE GENERATOR CONTROL UNIT NO. 2.
M 55-1520-238-23.

END OF TASK

9-3-1. DC ELECTRICAL POWER GENERATION [illegible] OPERATIONAL CHECK (cont)

9-3-1. DC ELECTRICAL POWER GENERATION [illegible] OPERATIONAL CHECK

Tools:

Nomenclature

Tool Kit, Electrical Repairer's

Multimeter, AN/USM-[illegible]

Personnel Required:

[illegible] Aircraft Electr[illegible]
One person to [illegible]

9-3-1. DC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

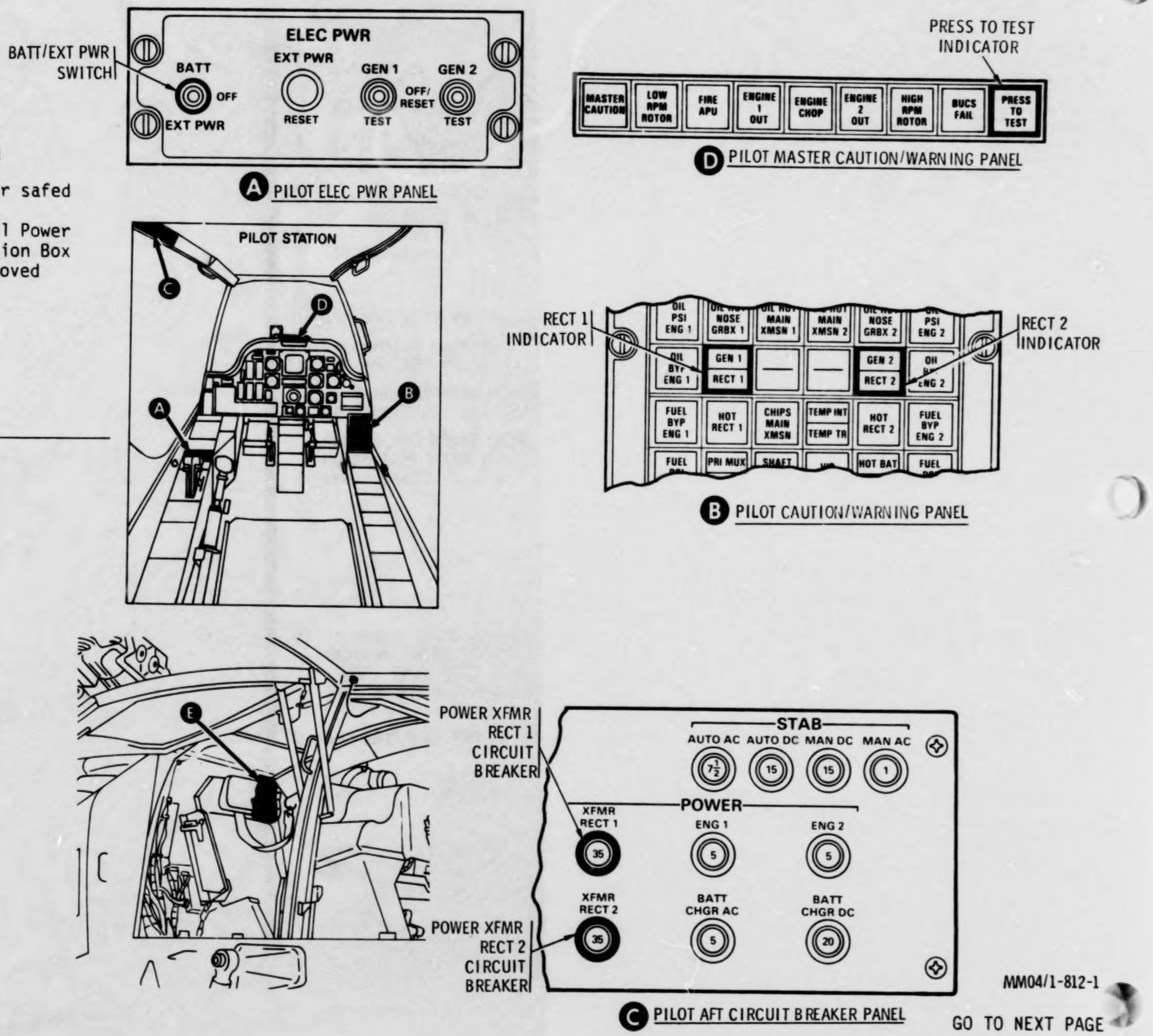
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical Power Distribution Box Cover Removed

WARNING

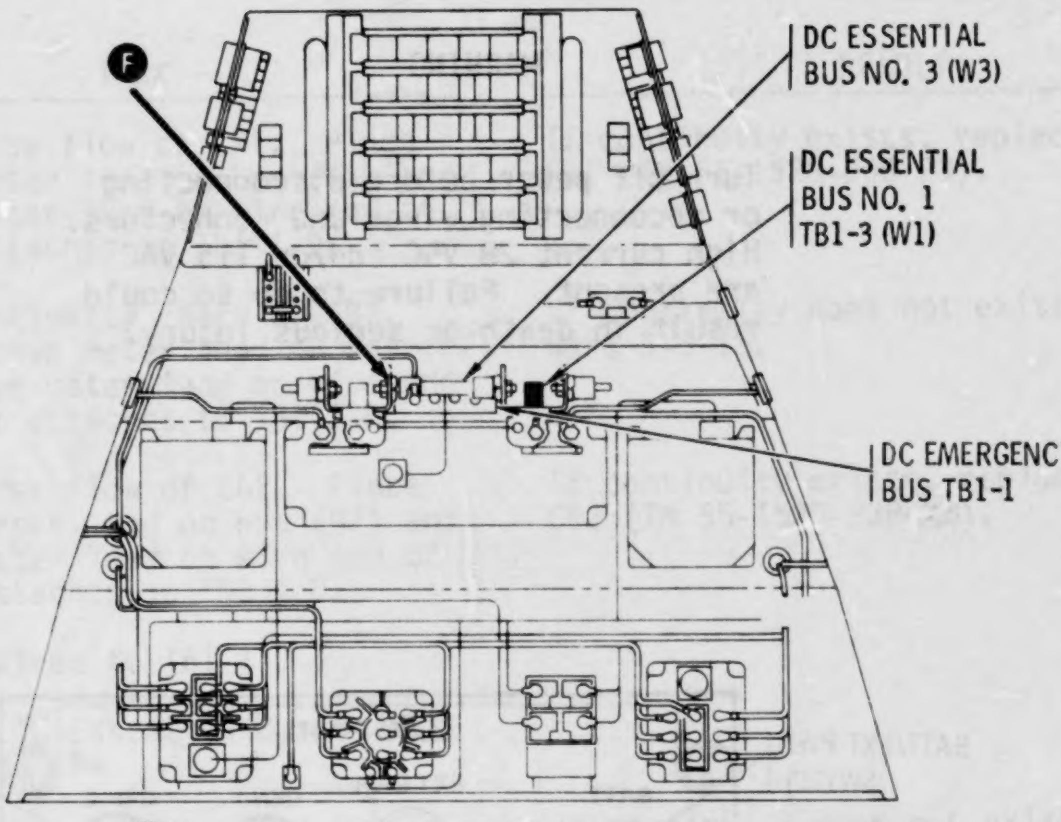
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


BATT/EXT PWR SWITCH
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
GEN 2
OFF/RESET
TEST
TEST
Ⓐ PILOT ELEC PWR PANEL
PRESS TO TEST INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST
Ⓓ PILOT MASTER CAUTION/WARNING PANEL
PILOT STATION
C
D
A
B
RECT 1 INDICATOR
RECT 2 INDICATOR
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL
PRI MUX
SHAFT
HOT BAT
FUEL
Ⓑ PILOT CAUTION/WARNING PANEL
E
POWER XFMR RECT 1 CIRCUIT BREAKER
POWER XFMR RECT 2 CIRCUIT BREAKER
STAB
AUTO AC
AUTO DC
MAN DC
MAN AC
7½
15
15
1
POWER
XFMR RECT 1
ENG 1
ENG 2
35
5
5
XFMR RECT 2
BATT CHGR AC
BATT CHGR DC
35
5
20
Ⓒ PILOT AFT CIRCUIT BREAKER PANEL

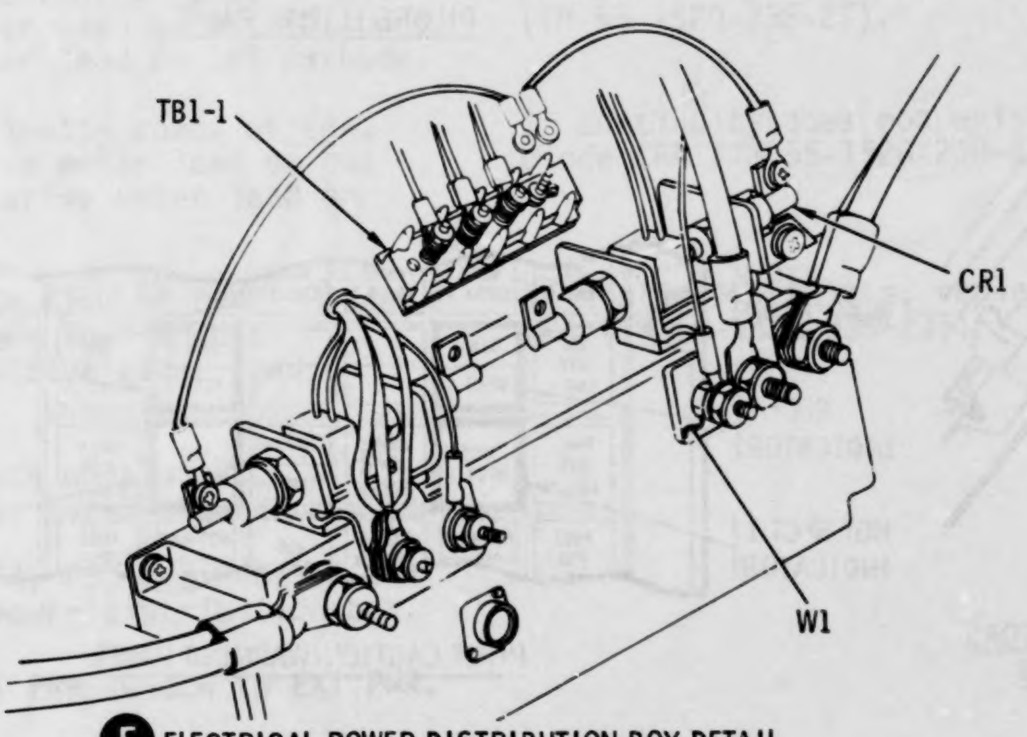
MM04/1-812-1

GO TO NEXT PAGE

9-3-1. DC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)


F
DC ESSENTIAL BUS NO. 3 (W3)
DC ESSENTIAL BUS NO. 1 TB1-3 (W1)
DC EMERGENCY BUS TB1-1

E ELECTRICAL POWER DISTRIBUTION BOX (FORWARD VIEW)



F ELECTRICAL POWER DISTRIBUTION BOX DETAIL (DC ESSENTIAL BUS NO. 3 REMOVED FOR CLARITY)

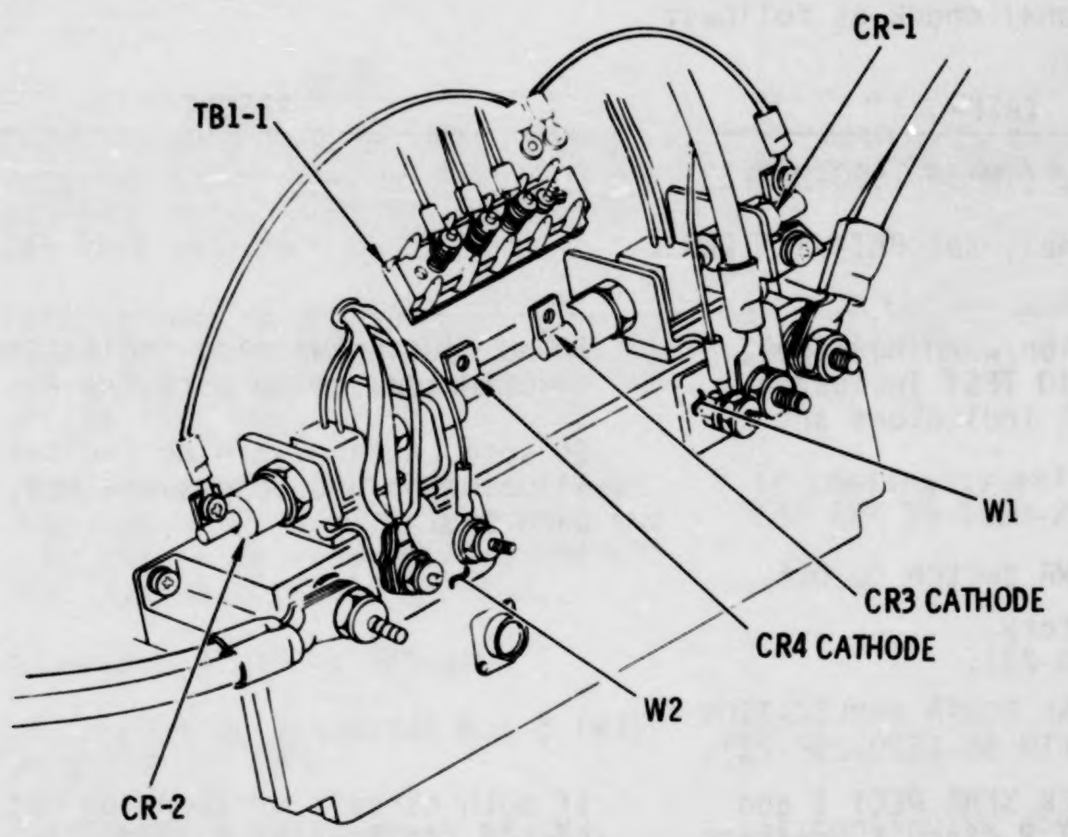
MM04/1-812-2A

A. Perform operational check as follows:

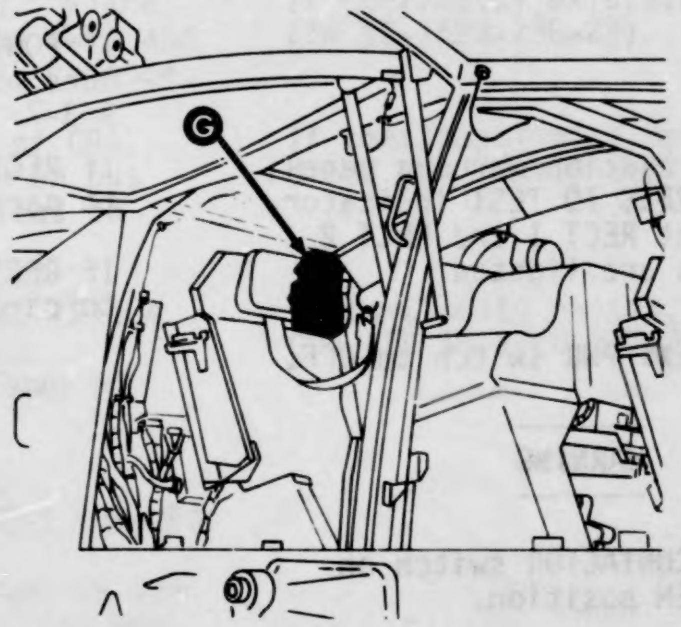
TASK	RESULT
1. Connect battery (TM 55-1520-238-23).	
2. On **ELEC PWR** panel, set **BATT/EXT PWR** switch to **BATT**.	
3. On master caution/warning panel, depress **PRESS TO TEST** indicator. Verify that all indicators are illuminated.	If no caution/warning indicators are illuminated, to to para 9-4-4. If some caution/warning indicators are illuminated and others are not, go to para 9-31-1.
4. Set **BATT/EXT PWR** switch to **OFF**.	
5. Disconnect battery (TM 55-1520-238-23).	
6. Perform EXTERNAL POWER APPLICATION - ELECTRICAL (TM 55-1520-238-23).	
7. Ensure the **POWER XFMR RECT 1** and **POWER XFMR RECT 2** circuit breakers are closed.	If both circuit breakers do not stay closed, go to para 9-3-10. If **POWER XFMR RECT 1** circuit breaker, does not stay closed, go to para 9-3-6. If **POWER XFMR RECT 2** circuit breaker, does not stay closed, go to para 9-3-7.
8. On master caution/warning panel, depress **PRESS TO TEST** indicator. Verify that **RECT 1** and **RECT 2** indicators are lighted.	If **RECT 1** indicator is not lighted go to para 9-3-19. If **RECT 2** indicator is not lighted go to para 9-3-20.
9. Set **BATT/EXT PWR** switch to **OFF**.	
WARNING **Place AC CONTACTOR switch on GSE to OPEN position.**	
10. Disconnect wires from TB1-1-D.	
11. Perform continuity check of CR1. Place positive meter lead on bus (W1) and negative meter lead on wire end of CR1 that attaches to TB1-1-D.	If continuity does not exist, go to para 9-3-12.

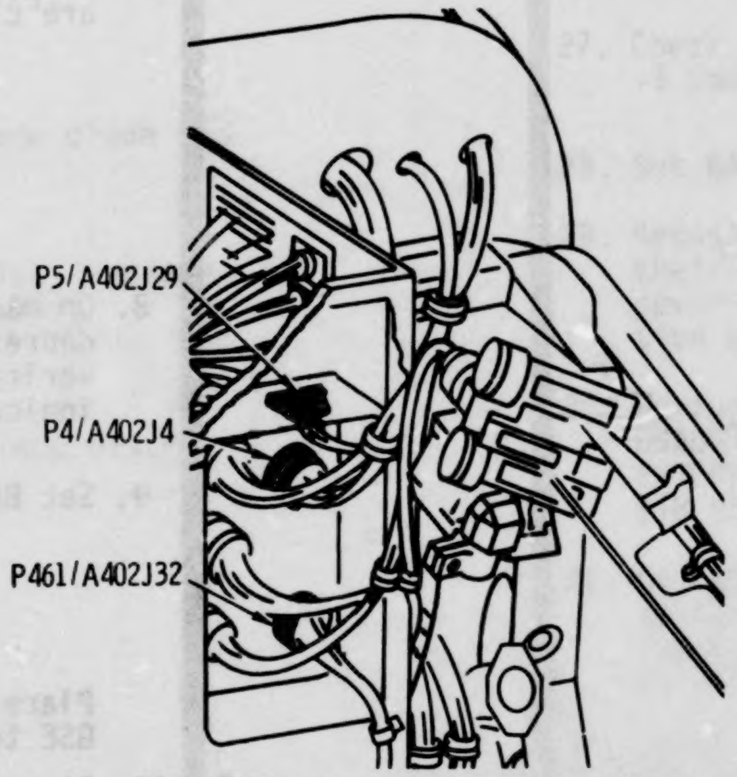
GO TO NEXT PAGE

9-3-1. DC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)


CR-1
TB1-1
W1
CR3 CATHODE
CR4 CATHODE
W2
CR-2

ELECTRICAL POWER DISTRIBUTION BOX DETAIL
(DC ESSENTIAL BUS NO. 3
REMOVED FOR CLARITY)

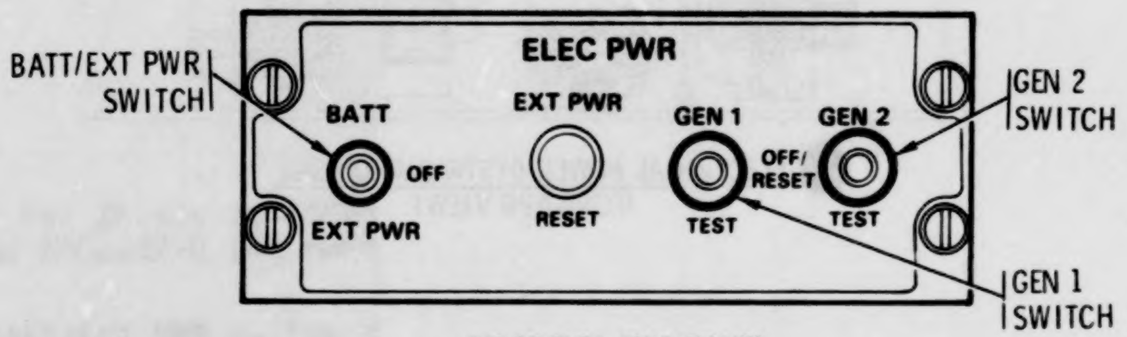



P5/A402J29
P4/A402J4
P461/A402J32

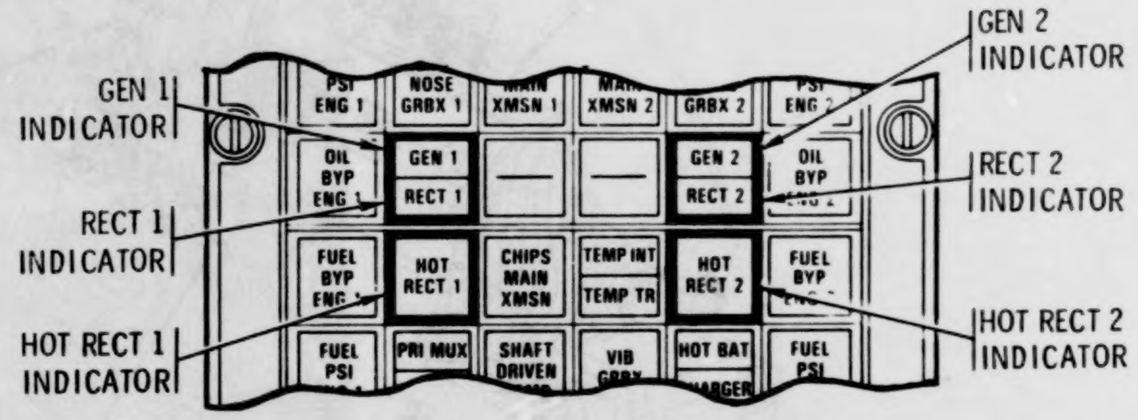
Ⓖ CIRCUIT BREAKER CONNECTORS ON ELECTRICAL POWER DISTRIBUTION BOX

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


BATT/EXT PWR SWITCH
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
GEN 2
OFF/RESET
TEST
TEST
GEN 2 SWITCH
GEN 1 SWITCH

PILOT ELEC PWR PANEL


GEN 1 INDICATOR
RECT 1 INDICATOR
HOT RECT 1 INDICATOR
GEN 2 INDICATOR
RECT 2 INDICATOR
HOT RECT 2 INDICATOR
PSI ENG 1
NOSE GRBX 1
XMSN 1
XMSN 2
GRBX 2
PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP
FUEL PSI
PRI MUX
SHAFT DRIVEN
VIB GRBX
HOT BAT
CHARGER
FUEL PSI

PILOT CAUTION/WARNING PANEL

MM04/1-812-3

GO TO NEXT PAGE

9-3-1. DC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

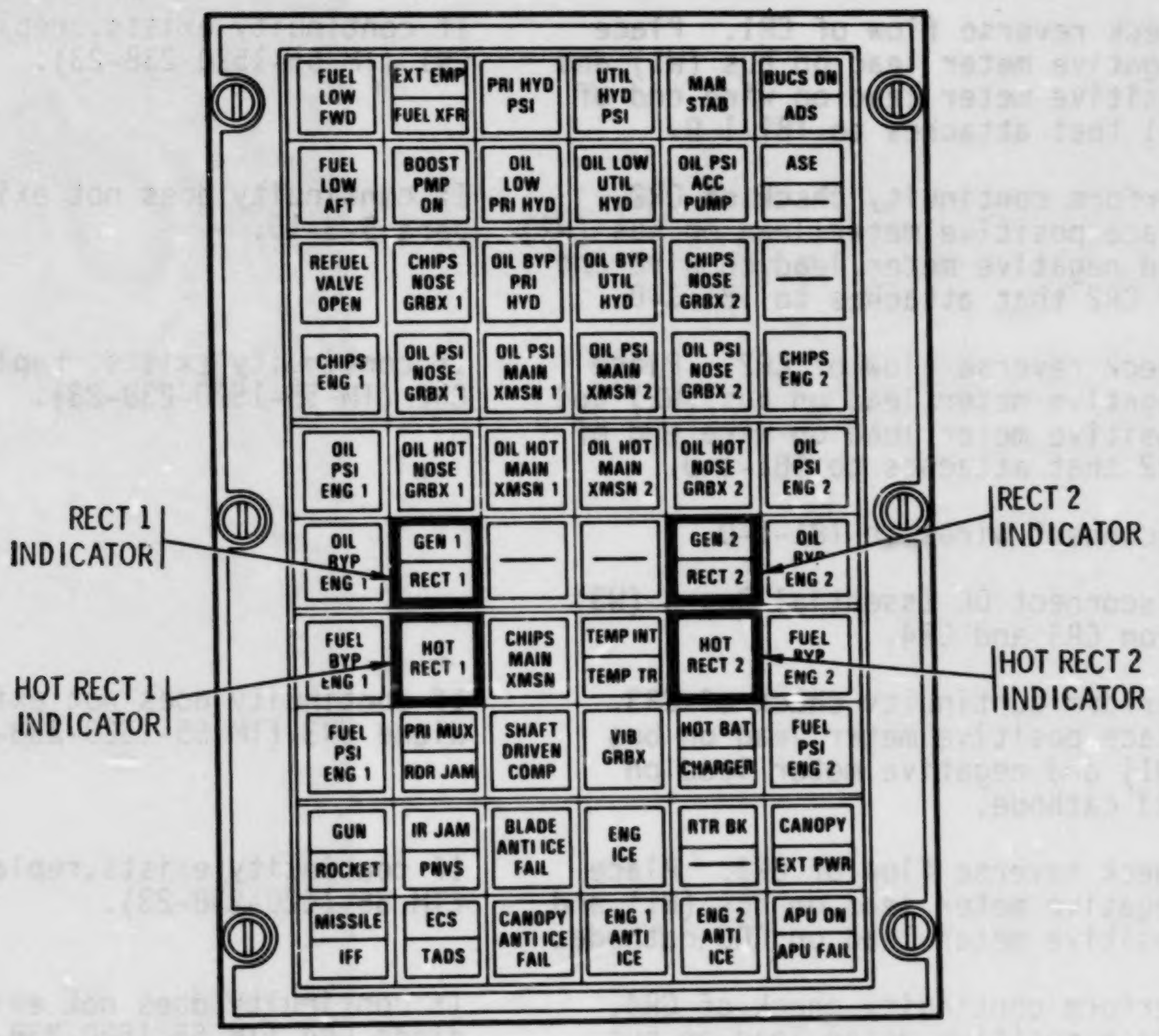
TASK	RESULT
12. Check reverse flow of CR1. Place negative meter lead on bus (W1) and positive meter lead on wire end of CR1 that attaches to TB1-1-D.	If continuity exists, replace diode CR1 (TM 55-1520-238-23).
13. Perform continuity check of CR2. Place positive meter lead on bus (W2) and negative meter lead on wire end of CR2 that attaches to TB1-1-D.	If continuity does not exist, go to para 9-3-15.
14. Check reverse flow of CR2. Place negative meter lead on bus (W2) and positive meter lead on wire end of CR2 that attaches to TB1-1-D.	If continuity exists, replace diode CR2 (TM 55-1520-238-23).
15. Reconnect wires to TB1-1-D.	
16. Disconnect DC Essential Bus 3 (W3) from CR3 and CR4.	
17. Perform continuity check of CR3. Place positive meter lead on bus (W1) and negative meter lead on CR3 cathode.	If continuity does not exist, replace diode CR3 (TM 55-1520-238-23).
18. Check reverse flow of CR3. Place negative meter lead on bus (W1) and positive meter lead on CR3 cathode.	If continuity exists,replace diode CR3 (TM 55-1520-238-23).
19. Perform continuity check of CR4. Place positive meter lead on bus (W2) and negative meter lead on CR4 cathode.	If continuity does not exist, replace diode CR4 (TM 55-1520-238-23).
20. Check reverse flow of CR4. Place negative meter lead on bus (W2) and positive meter lead on CR4 cathode.	If continuity exists, replace diode CR4 (TM 55-1520-238-23).
21. Reconnect both ends of DC Essential Bus 3 (W3) to CR3 and CR4.	
22. Disconnect P4, P5, and P461 on the electrical power distribution box.	
23. Set **BATT/EXT PWR** switch to **EXT PWR**.	

TASK	RESULT
24. Check for 28 vdc at A402J4-M, -N, and A402J32-K (DC essential bus 1).	If voltage is not present at A402J32-K, A402J4-M, and -N, go to para 9-3-13. If voltage is not present on one pin and present on the others, go to para 9-3-4.
25. Check for 28 vdc at A402J4-G and A402J4-J (DC essential bus 2).	If voltage is not present at A402J32-G, and -J, go to para 9-3-14. If voltage is not present on one pin and present on the other, go to para 9-3-5.
26. Check for 28 vdc at A402J4-K, -L, A402J32-H, and -J (DC essential bus 3).	If voltage is not present at A402J32-H, and -J, A402J4-K and -L, go to para 9-3-15. If voltage is not present on one pin and present on the others, go to para 9-3-16.
27. Check for 28 vdc at A402J29-1, -2, -3 and A402J32-G (DC emergency bus).	If voltage is not present on one pin and is present on the others, go to para 9-3-11.
28. Set **BATT/EXT PWR** switch to **OFF**.	
29. Reconnect P4, P5, and P461 to their mating connectors. Install cover on electrical power distribution box.	
30. Perform steps 1 thru 11 of APU OPERATING INSTRUCTIONS - USING EXTERNAL POWER procedures (TM 55-1520-238-23).	
31. On **ELEC PWR** panel hold **GEN 1** switch in **TEST** position. **GEN 1** indicator on caution/warning panel is not lighted.	If **GEN 1** indicator is lighted, go to para 9-2-8.
32. Release **GEN 1** switch and hold **GEN 2** switch in **TEST** position. **GEN 2** indicator on caution/warning panel is not lighted.	If **GEN 2** indicator is lighted, go to para 9-2-9.

GO TO NEXT PAGE

9-3-1. DC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

TASK	RESULT
33. Release GEN 2 switch. Place GEN 1 switch to GEN 1. RECT 1 and HOT RECT 1 indicators on caution/warning panel are not lighted.	If RECT 1 indicator is lighted, go to para 9-3-8. If HOT RECT 1 indicator is lighted, go to para 9-3-17.
34. Set GEN 2 switch to GEN 2. RECT 2 and HOT RECT 2 indicators on caution/warning panel are not lighted.	If RECT 2 indicator is lighted, go to para 9-3-9. If HOT RECT 2 indicator is lighted, go to para 9-3-18.
35. Perform steps 14 thru 19 of APU OPERATING INSTRUCTIONS - USING EXTERNAL POWER procedures (TM 55-1520-238-23).	

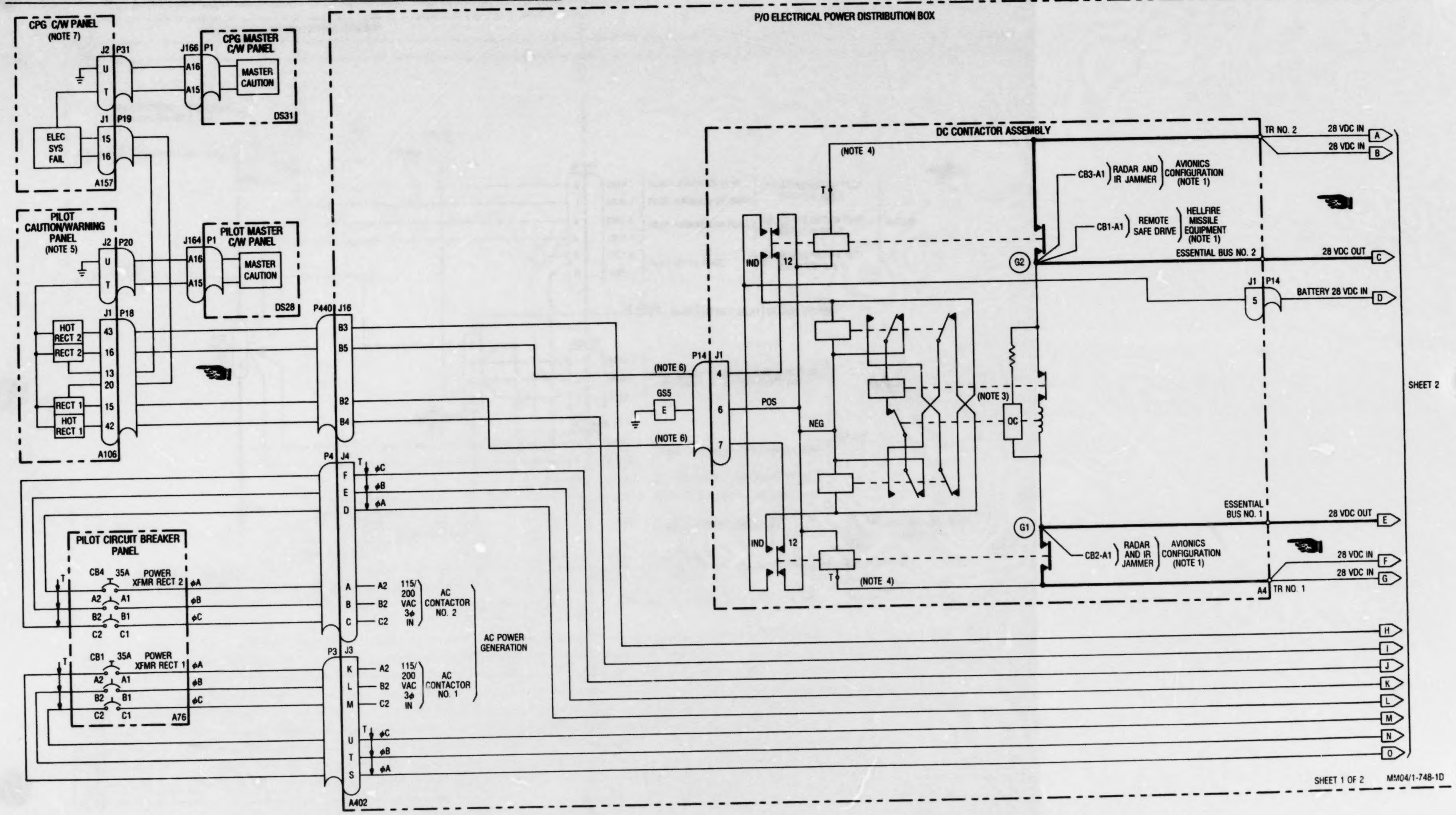

RECT 1 INDICATOR
HOT RECT 1 INDICATOR
RECT 2 INDICATOR
HOT RECT 2 INDICATOR
FUEL LOW FWD
EXT EMP
FUEL XFR
PRI HYD PSI
UTIL HYD PSI
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
BOOST PMP ON
OIL LOW PRI HYD
OIL LOW UTIL HYD
OIL PSI ACC PUMP
ASE
REFUEL VALVE OPEN
CHIPS NOSE GRBX 1
OIL BYP PRI HYD
OIL BYP UTIL HYD
CHIPS NOSE GRBX 2
CHIPS ENG 1
OIL PSI NOSE GRBX 1
OIL PSI MAIN XMSN 1
OIL PSI MAIN XMSN 2
OIL PSI NOSE GRBX 2
CHIPS ENG 2
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

PILOT CAUTION/WARNING PANEL

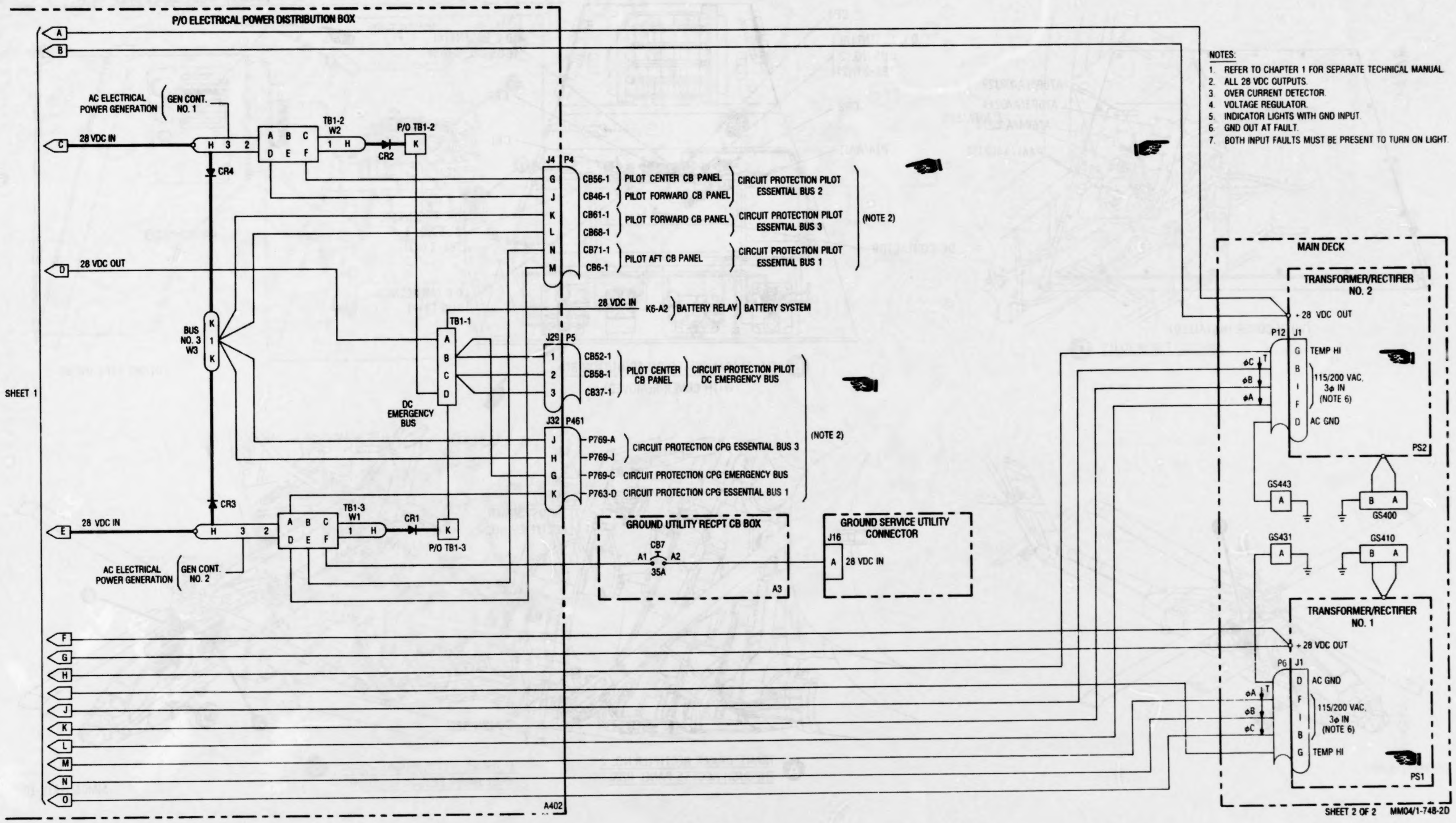
MM04/1-812-4

END OF TASK

9-3-2. DC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM


CPG C/W PANEL
(NOTE 7)
J2
P31
U
T
J1
P19
ELEC SYS FAIL
15
16
A157
J166
P1
CPG MASTER C/W PANEL
A16
A15
MASTER CAUTION
DS31
PILOT CAUTION/WARNING PANEL
(NOTE 5)
J2
P20
U
T
J1
P18
HOT RECT 2
RECT 2
43
16
13
20
RECT 1
HOT RECT 1
15
42
A106
J164
P1
PILOT MASTER C/W PANEL
A16
A15
MASTER CAUTION
DS28
P440
J16
B3
B5
B2
B4
P4
J4
T
F
E
D
ϕC
ϕB
ϕA
PILOT CIRCUIT BREAKER PANEL
CB4
35A
POWER XFMR RECT 2
A2
A1
B2
B1
C2
C1
ϕA
ϕB
ϕC
T
CB1
35A
POWER XFMR RECT 1
A2
A1
B2
B1
C2
C1
ϕA
ϕB
ϕC
A76
A
B
C
A2
B2
C2
115/200 VAC 3ϕ IN
AC CONTACTOR NO. 2
AC POWER GENERATION
P3
J3
K
L
M
A2
B2
C2
115/200 VAC 3ϕ IN
AC CONTACTOR NO. 1
T
U
T
S
ϕC
ϕB
ϕA
A402
P/O ELECTRICAL POWER DISTRIBUTION BOX
(NOTE 6)
P14
J1
4
6
7
GS5
E
(NOTE 6)
POS
NEG
DC CONTACTOR ASSEMBLY
(NOTE 4)
T
IND
12
(NOTE 3)
OC
IND
12
T
(NOTE 4)
G2
G1
CB3-A1
RADAR AND IR JAMMER
AVIONICS CONFIGURATION (NOTE 1)
CB1-A1
REMOTE SAFE DRIVE
HELLFIRE MISSILE EQUIPMENT (NOTE 1)
ESSENTIAL BUS NO. 2
TR NO. 2
28 VDC IN
A
28 VDC IN
B
28 VDC OUT
C
J1
P14
5
BATTERY 28 VDC IN
D
ESSENTIAL BUS NO. 1
28 VDC OUT
E
CB2-A1
RADAR AND IR JAMMER
AVIONICS CONFIGURATION (NOTE 1)
28 VDC IN
F
28 VDC IN
G
A4
TR NO. 1
H
I
J
K
L
M
N
O
SHEET 2
SHEET 1 OF 2
MM04/1-748-1D

9-3-2. DC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM (cont)

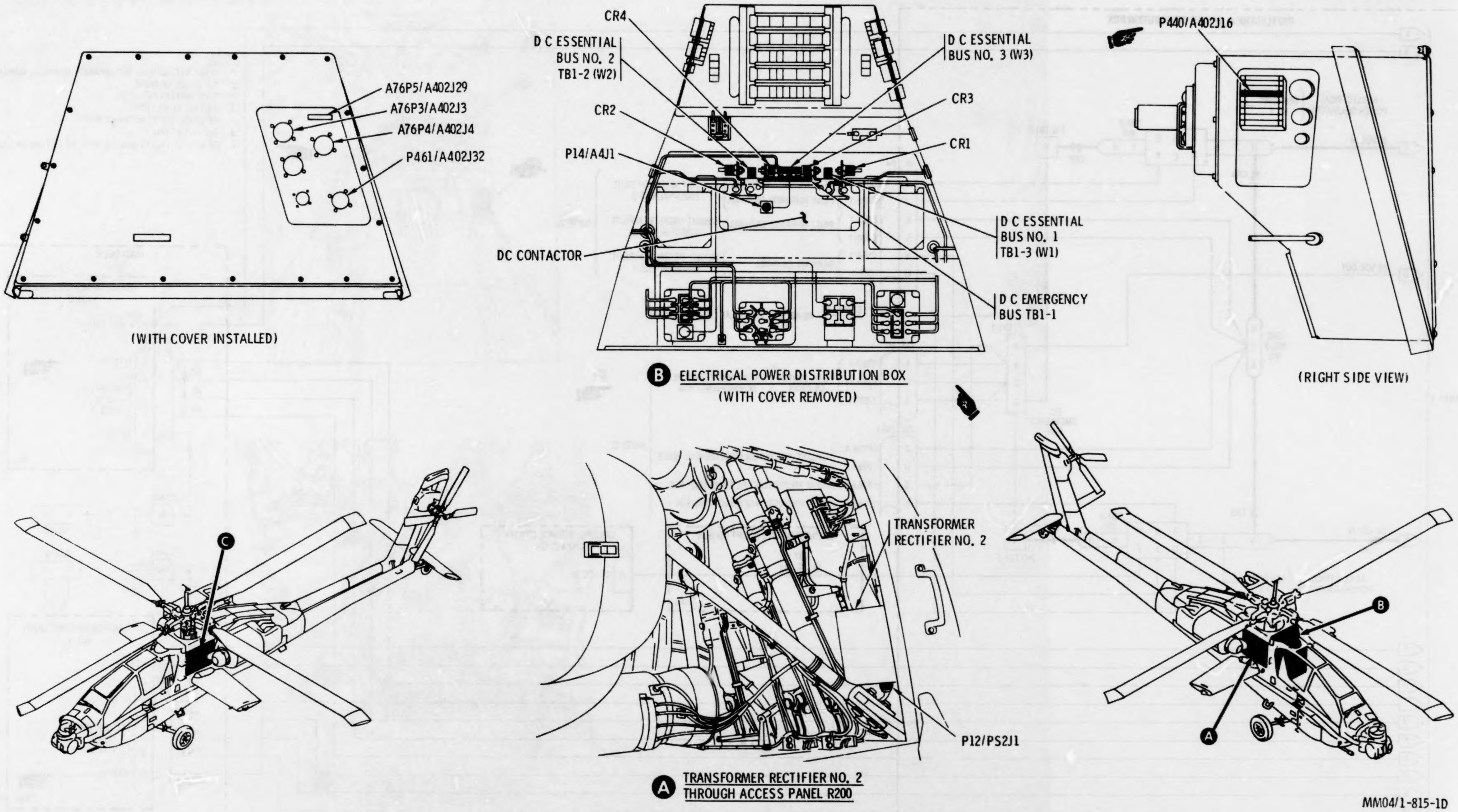

P/O ELECTRICAL POWER DISTRIBUTION BOX
A
B
AC ELECTRICAL POWER GENERATION
GEN CONT. NO. 1
C
28 VDC IN
H 3 2
A B C D E F
TB1-2 W2
1 H
CR2
P/O TB1-2
K
CR4
J4 P4
G J K L N M
CB56-1
CB46-1
CB61-1
CB68-1
CB71-1
CB6-1
PILOT CENTER CB PANEL
PILOT FORWARD CB PANEL
PILOT FORWARD CB PANEL
PILOT AFT CB PANEL
CIRCUIT PROTECTION PILOT ESSENTIAL BUS 2
CIRCUIT PROTECTION PILOT ESSENTIAL BUS 3
CIRCUIT PROTECTION PILOT ESSENTIAL BUS 1
(NOTE 2)
D
28 VDC OUT
28 VDC IN
K6-A2
BATTERY RELAY
BATTERY SYSTEM
BUS NO. 3 W3
K 1 K
TB1-1
A B C D
DC EMERGENCY BUS
J29 P5
1 2 3
CB52-1
CB58-1
CB37-1
PILOT CENTER CB PANEL
CIRCUIT PROTECTION PILOT DC EMERGENCY BUS
SHEET 1
J32 P461
J H G K
P769-A
P769-J
CIRCUIT PROTECTION CPG ESSENTIAL BUS 3
P769-C CIRCUIT PROTECTION CPG EMERGENCY BUS
P763-D CIRCUIT PROTECTION CPG ESSENTIAL BUS 1
(NOTE 2)
CR3
E
28 VDC IN
H 3 2
A B C D E F
TB1-3 W1
1 H
CR1
K
P/O TB1-3
AC ELECTRICAL POWER GENERATION
GEN CONT. NO. 2
GROUND UTILITY RECPT CB BOX
CB7
A1 A2
35A
A3
GROUND SERVICE UTILITY CONNECTOR
J16
A
28 VDC IN
F
G
H
J
K
L
M
N
O
A402
MAIN DECK
TRANSFORMER/RECTIFIER NO. 2
+28 VDC OUT
P12 J1
G TEMP HI
B I F
ϕC T
ϕB
ϕA
115/200 VAC, 3ϕ IN (NOTE 6)
D AC GND
PS2
GS443
A
GS400
B A
GS431
A
GS410
B A
TRANSFORMER/RECTIFIER NO. 1
+28 VDC OUT
P6 J1
D AC GND
F I B
ϕA T
ϕB
ϕC
115/200 VAC, 3ϕ IN (NOTE 6)
G TEMP HI
PS1

NOTES:

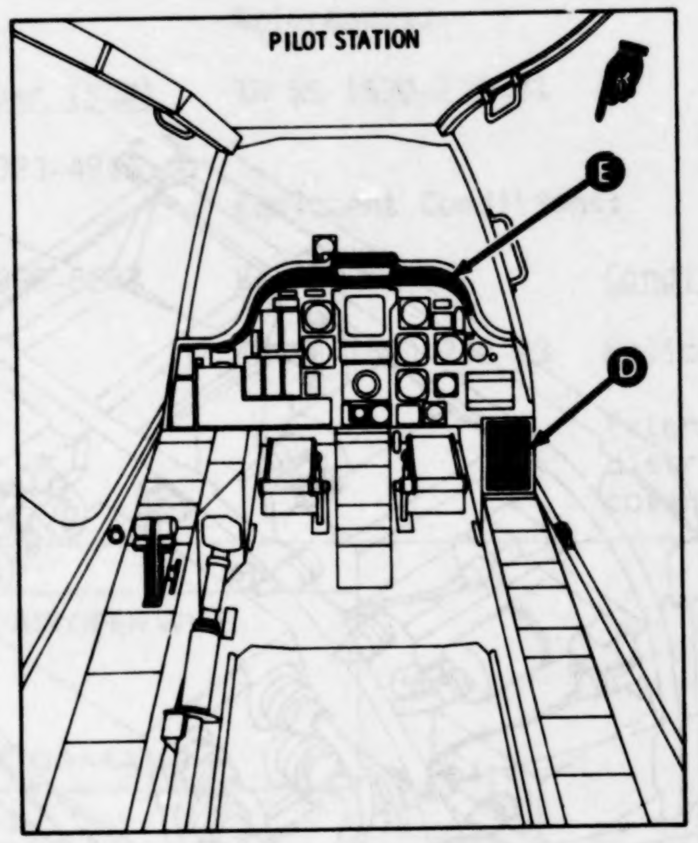
1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.
2. ALL 28 VDC OUTPUTS.
3. OVER CURRENT DETECTOR.
4. VOLTAGE REGULATOR.
5. INDICATOR LIGHTS WITH GND INPUT.
6. GND OUT AT FAULT.
7. BOTH INPUT FAULTS MUST BE PRESENT TO TURN ON LIGHT.

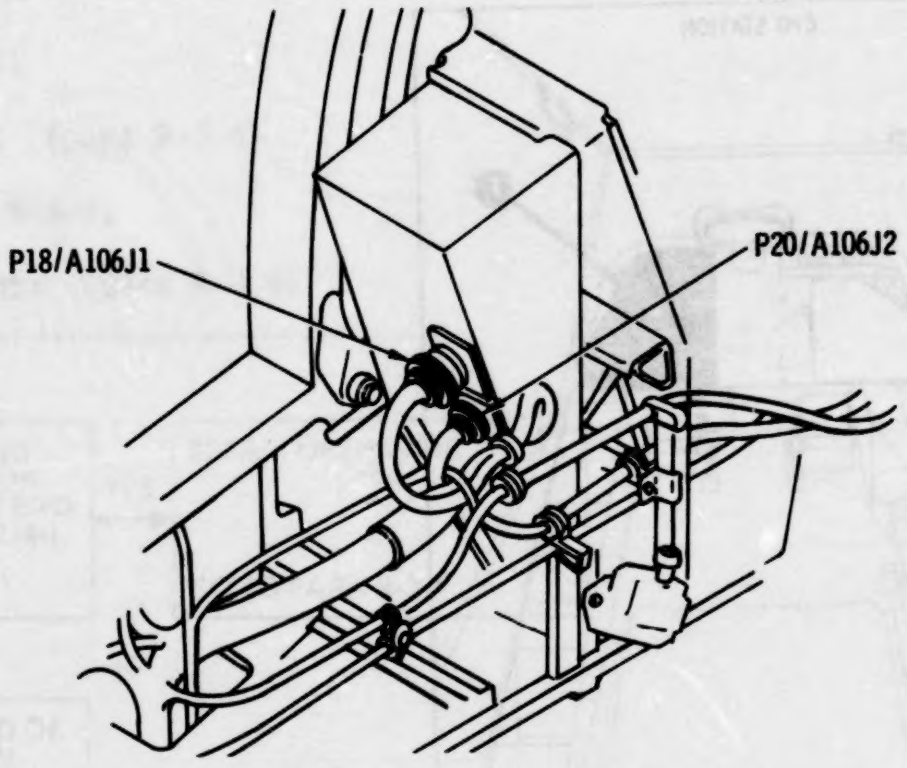
SHEET 2 OF 2 MM04/1-748-2D

9-3-3. DC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

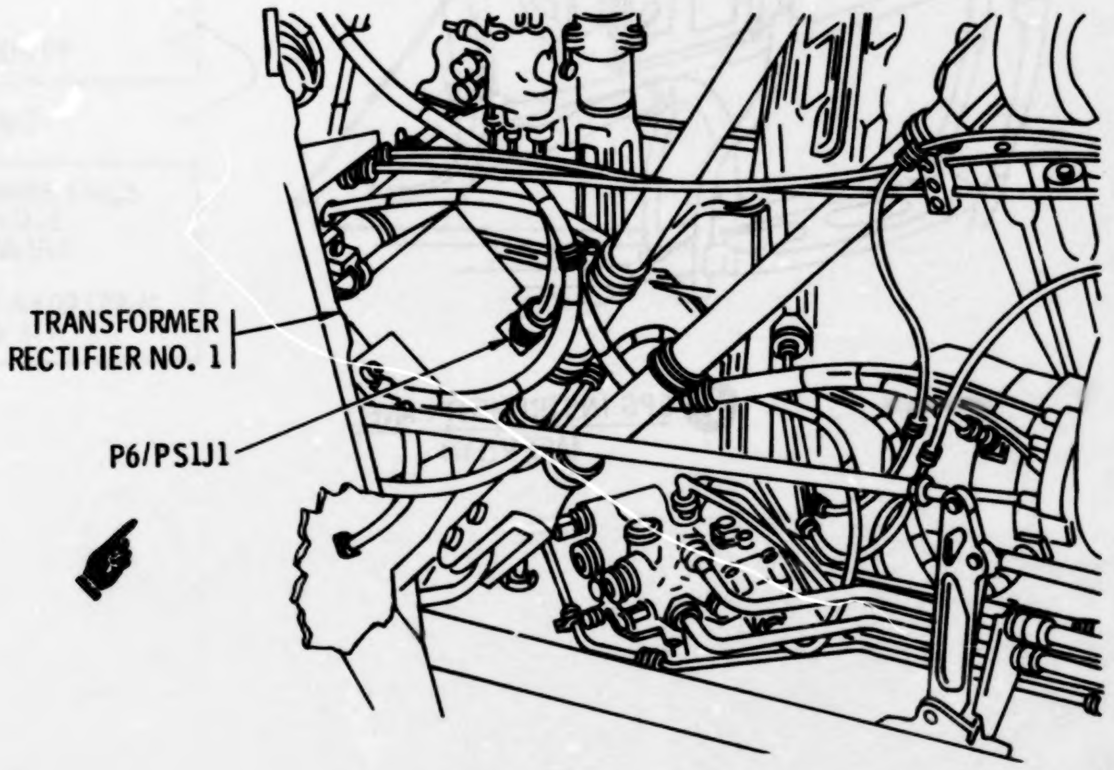

A76P5/A402J29
A76P3/A402J3
A76P4/A402J4
P461/A402J32
(WITH COVER INSTALLED)
CR4
D C ESSENTIAL BUS NO. 2 TB1-2 (W2)
CR2
P14/A4J1
DC CONTACTOR
D C ESSENTIAL BUS NO. 3 (W3)
CR3
CR1
D C ESSENTIAL BUS NO. 1 TB1-3 (W1)
D C EMERGENCY BUS TB1-1
B
ELECTRICAL POWER DISTRIBUTION BOX
(WITH COVER REMOVED)
P440/A402J16
(RIGHT SIDE VIEW)
C
TRANSFORMER RECTIFIER NO. 2
P12/PS2J1
A
TRANSFORMER RECTIFIER NO. 2 THROUGH ACCESS PANEL R200
B
A
MM04/1-815-1D

9-3-3. DC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


PILOT STATION
E
D


P18/A106J1
P20/A106J2

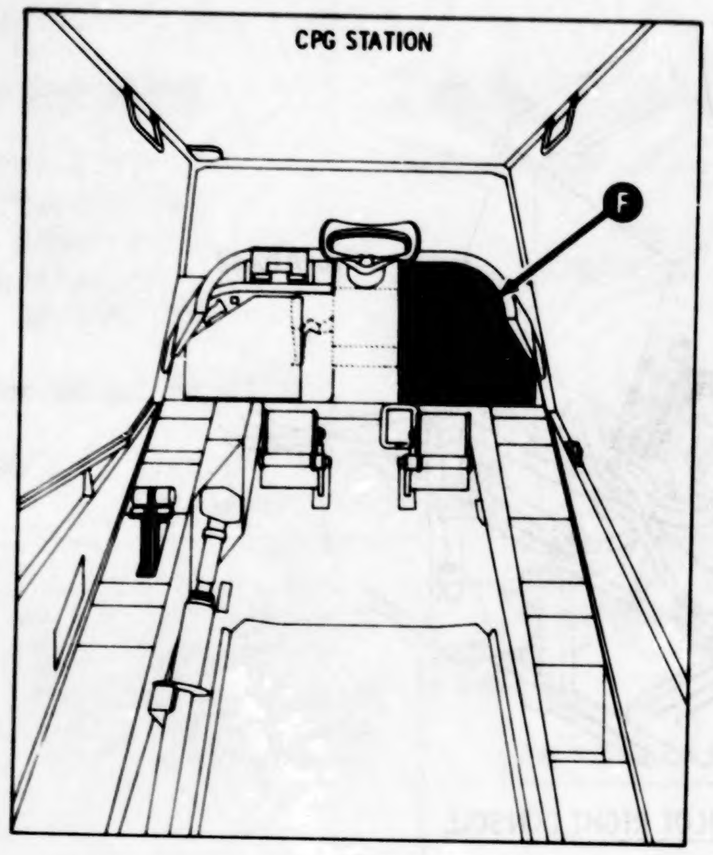
Ⓓ PILOT RIGHT CONSOLE

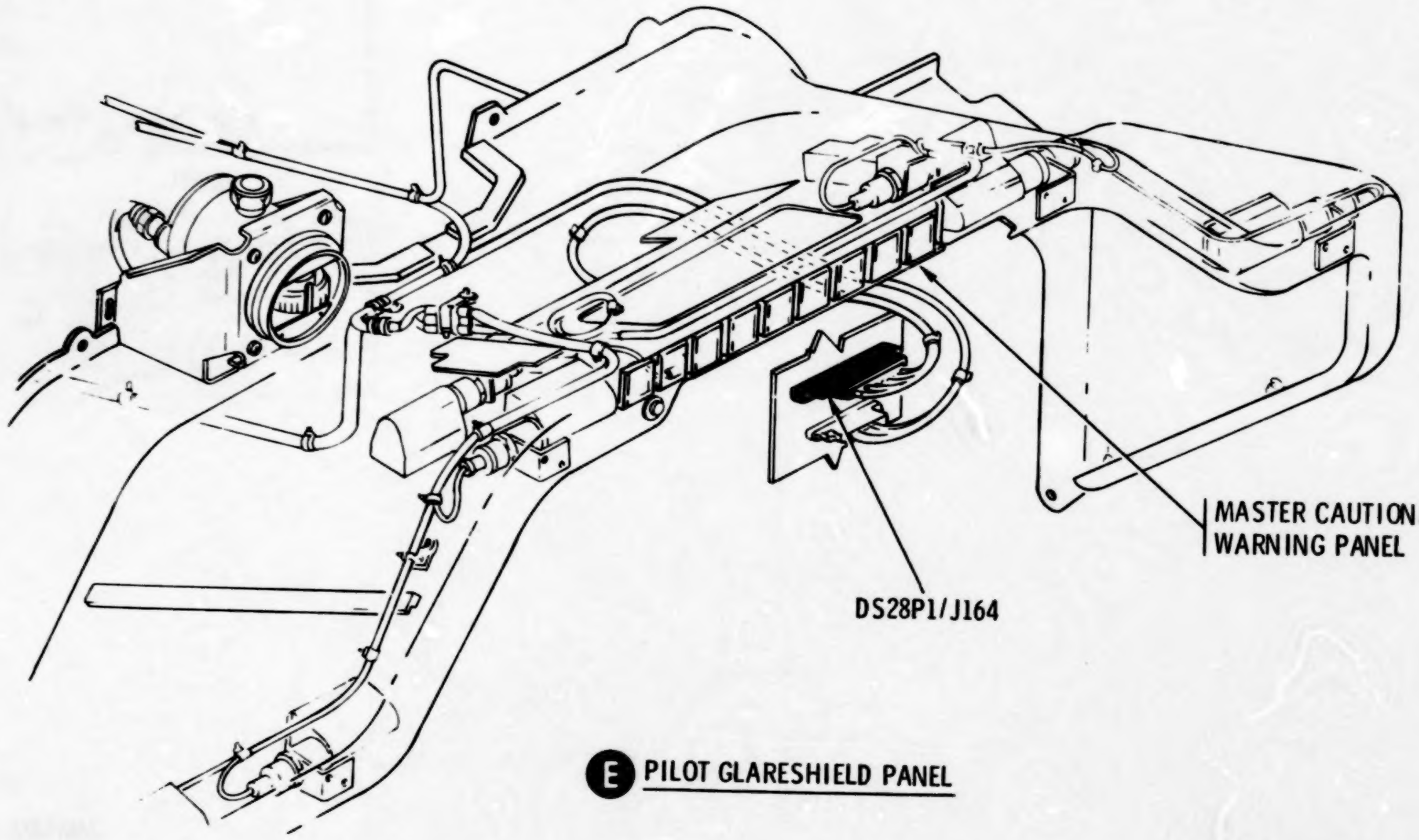

TRANSFORMER RECTIFIER NO. 1
P6/PS1J1

Ⓒ TRANSFORMER RECTIFIER NO. 1 THROUGH ACCESS PANEL L200

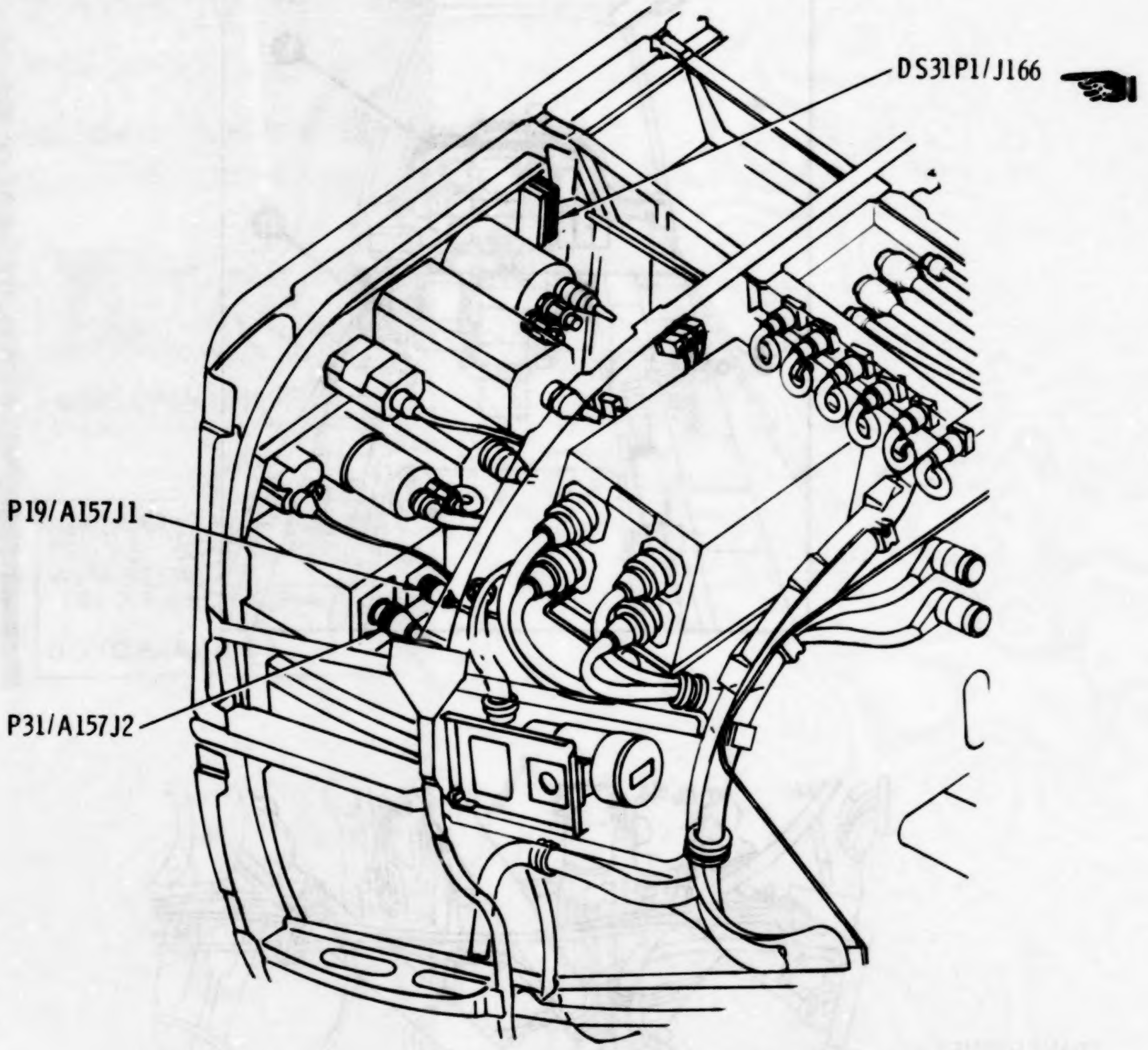
MM04/1-815-2D

9-3-3. DC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


CPG STATION
F


MASTER CAUTION/ WARNING PANEL
DS28P1/J164

E PILOT GLARESHIELD PANEL


DS31P1/J166
P19/A157J1
P31/A157J2

F CPG INSTRUMENT PANEL (AFT VIEW)

MM04/1-815-3C

9-3-4. POWER IS NOT AVAILABLE TO ALL DC ESSENTIAL BUS NO. 1 CIRCUIT BREAKERS

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

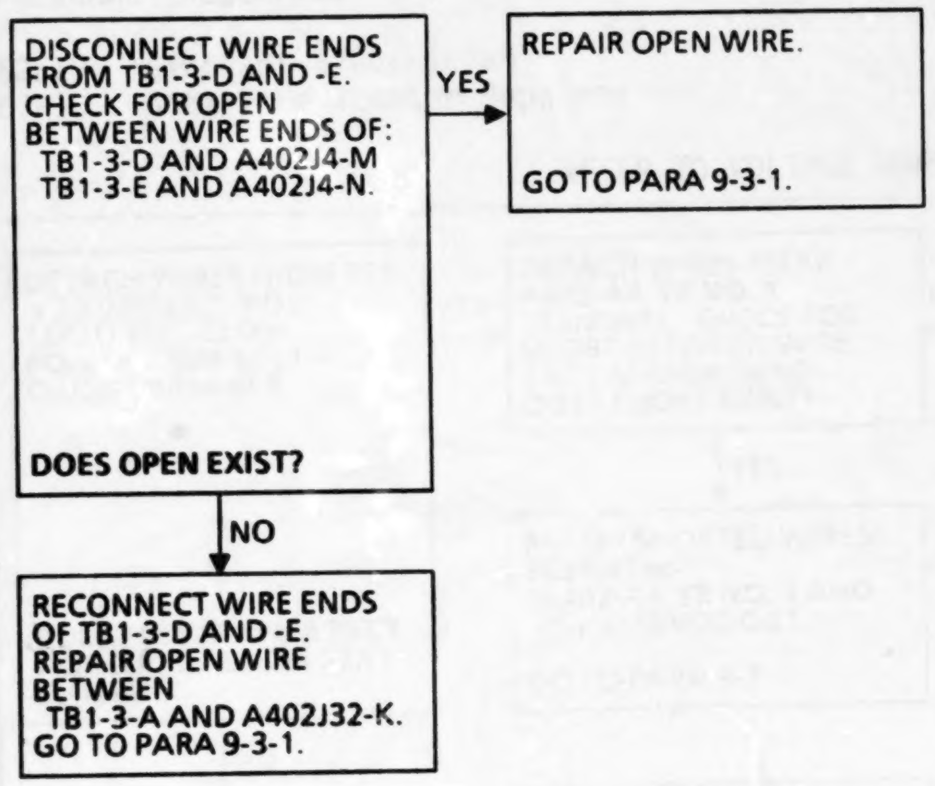
68F10	Aircraft Electrician
	One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power distribution box cover removed



DISCONNECT WIRE ENDS FROM TB1-3-D AND -E. CHECK FOR OPEN BETWEEN WIRE ENDS OF:
TB1-3-D AND A402J4-M
TB1-3-E AND A402J4-N.

DOES OPEN EXIST?

YES

REPAIR OPEN WIRE.

GO TO PARA 9-3-1.

NO

RECONNECT WIRE ENDS OF TB1-3-D AND -E. REPAIR OPEN WIRE BETWEEN
TB1-3-A AND A402J32-K.
GO TO PARA 9-3-1.

END OF TASK

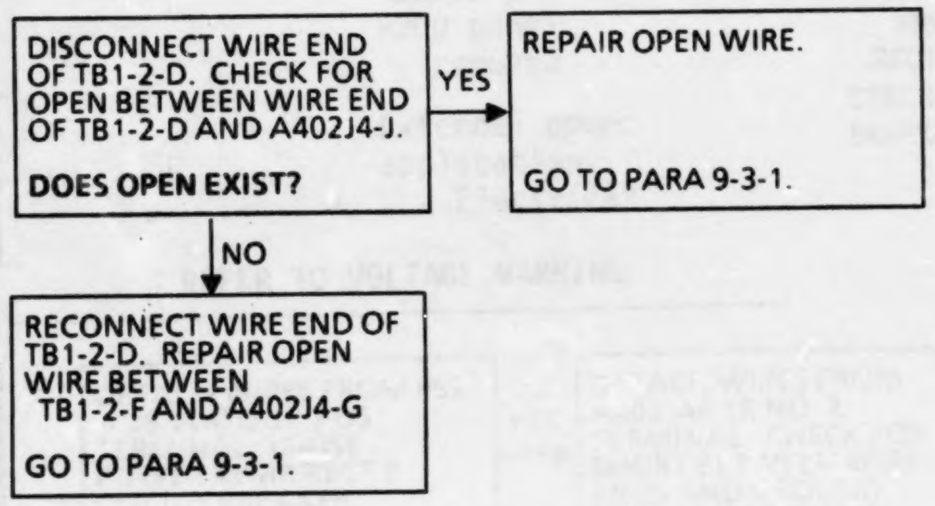
9-3-5. POWER IS NOT AVAILABLE TO ALL DC ESSENTIAL BUS NO. 2 CIRCUIT BREAKERS

Tools: (para 9-3-4)

Personnel Required: (para 9-3-4)

References: (para 9-3-4)

Equipment Conditions: (para 9-3-4)



DISCONNECT WIRE END OF TB1-2-D. CHECK FOR OPEN BETWEEN WIRE END OF TB1-2-D AND A402J4-J.

DOES OPEN EXIST?

YES

REPAIR OPEN WIRE.

GO TO PARA 9-3-1.

NO

RECONNECT WIRE END OF TB1-2-D. REPAIR OPEN WIRE BETWEEN
TB1-2-F AND A402J4-G

GO TO PARA 9-3-1.

END OF TASK

9-3-6. POWER XFMR RECT 1 CIRCUIT BREAKER (CB1) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10	Aircraft Electrician
67R10	Attack Helicopter Repairer

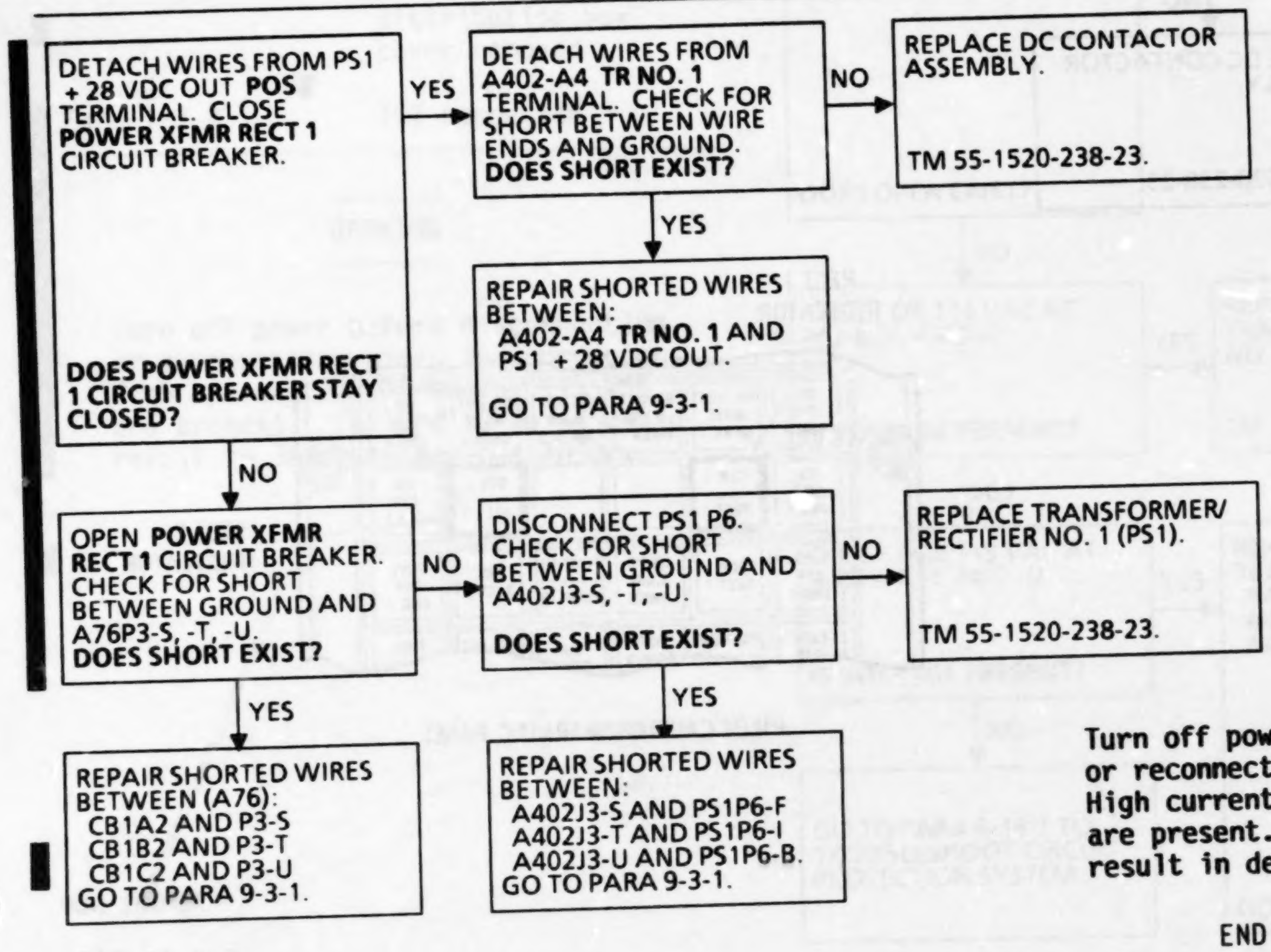
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions L200 panel - removed
	External power application - Electrical

REFER TO VOLTAGE WARNING



DETACH WIRES FROM PS1 + 28 VDC OUT **POS** TERMINAL. CLOSE **POWER XFMR RECT 1** CIRCUIT BREAKER.

DOES POWER XFMR RECT 1 CIRCUIT BREAKER STAY CLOSED?

DETACH WIRES FROM A402-A4 **TR NO. 1** TERMINAL. CHECK FOR SHORT BETWEEN WIRE ENDS AND GROUND. **DOES SHORT EXIST?**

REPLACE DC CONTACTOR ASSEMBLY.

TM 55-1520-238-23.

REPAIR SHORTED WIRES BETWEEN:
A402-A4 **TR NO. 1** AND PS1 + 28 VDC OUT.

GO TO PARA 9-3-1.

OPEN **POWER XFMR RECT 1** CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76P3-S, -T, -U. **DOES SHORT EXIST?**

DISCONNECT PS1 P6. CHECK FOR SHORT BETWEEN GROUND AND A402J3-S, -T, -U.

DOES SHORT EXIST?

REPLACE TRANSFORMER/ RECTIFIER NO. 1 (PS1).

TM 55-1520-238-23.

REPAIR SHORTED WIRES BETWEEN (A76):
CB1A2 AND P3-S
CB1B2 AND P3-T
CB1C2 AND P3-U
GO TO PARA 9-3-1.

REPAIR SHORTED WIRES BETWEEN:
A402J3-S AND PS1P6-F
A402J3-T AND PS1P6-I
A402J3-U AND PS1P6-B.
GO TO PARA 9-3-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-3-7. POWER XFMR RECT 2 CIRCUIT BREAKER (CB4) - DOES NOT STAY CLOSED

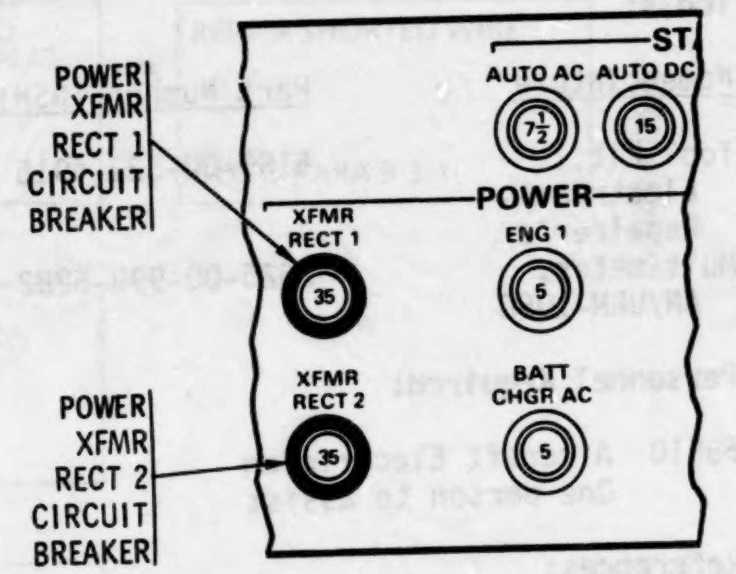
Tools: (para 9-3-6)

Personnel Required: (para 9-3-6)

References: (para 9-3-6)

Equipment Conditions:

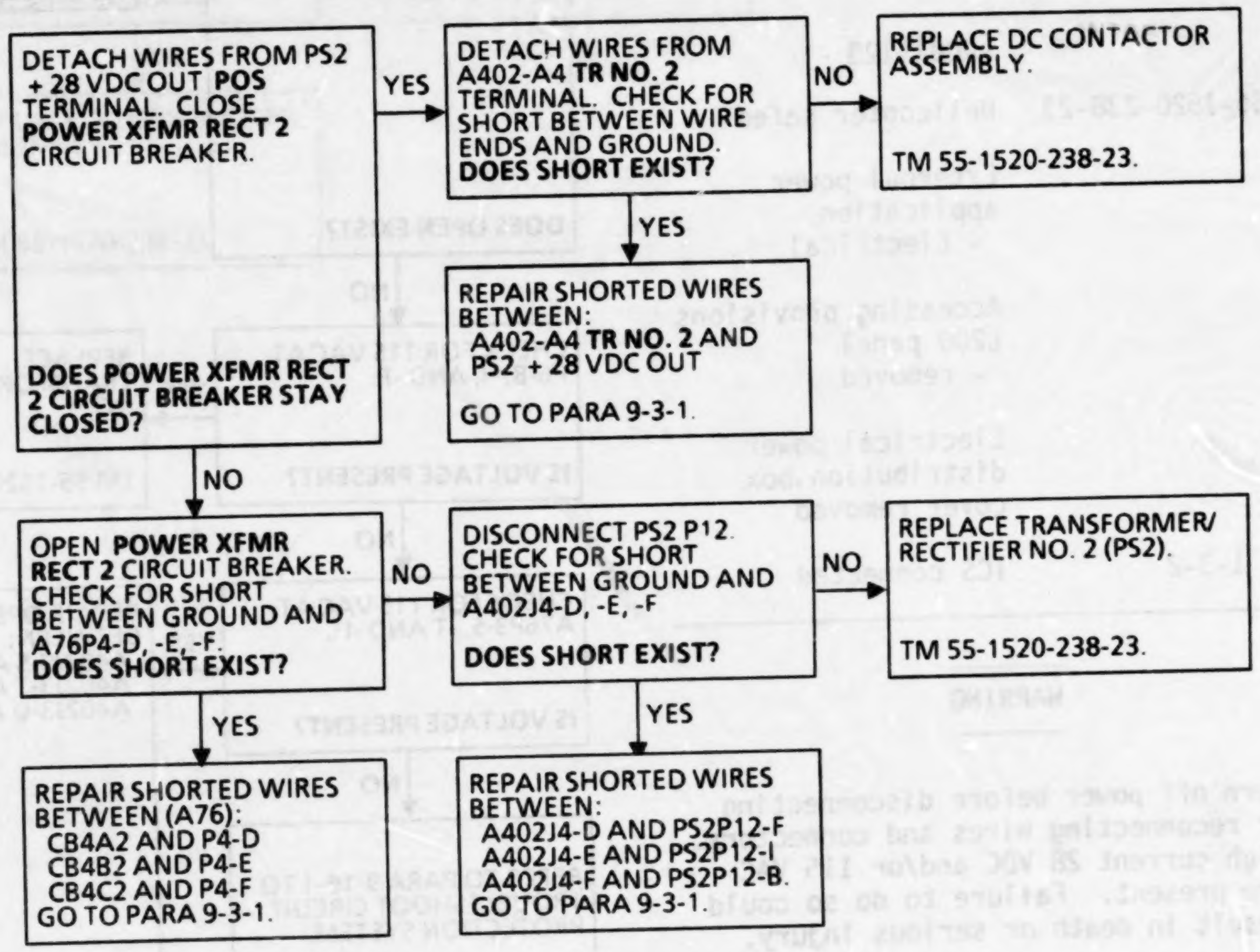
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions R200 panel - removed
	External power application - Electrical



PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-818A

REFER TO VOLTAGE WARNING



DETACH WIRES FROM PS2 + 28 VDC OUT **POS** TERMINAL. CLOSE **POWER XFMR RECT 2** CIRCUIT BREAKER.

DOES POWER XFMR RECT 2 CIRCUIT BREAKER STAY CLOSED?

DETACH WIRES FROM A402-A4 **TR NO. 2** TERMINAL. CHECK FOR SHORT BETWEEN WIRE ENDS AND GROUND. **DOES SHORT EXIST?**

REPLACE DC CONTACTOR ASSEMBLY.

TM 55-1520-238-23.

REPAIR SHORTED WIRES BETWEEN:
A402-A4 **TR NO. 2** AND PS2 + 28 VDC OUT

GO TO PARA 9-3-1.

OPEN **POWER XFMR RECT 2** CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76P4-D, -E, -F. **DOES SHORT EXIST?**

DISCONNECT PS2 P12. CHECK FOR SHORT BETWEEN GROUND AND A402J4-D, -E, -F

DOES SHORT EXIST?

REPLACE TRANSFORMER/ RECTIFIER NO. 2 (PS2).

TM 55-1520-238-23.

REPAIR SHORTED WIRES BETWEEN (A76):
CB4A2 AND P4-D
CB4B2 AND P4-E
CB4C2 AND P4-F
GO TO PARA 9-3-1.

REPAIR SHORTED WIRES BETWEEN:
A402J4-D AND PS2P12-F
A402J4-E AND PS2P12-I
A402J4-F AND PS2P12-B.
GO TO PARA 9-3-1.

END OF TASK

9-3-8. RECT 1 INDICATOR ON PILOT CAUTION/WARNING PANEL - LIGHTS

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

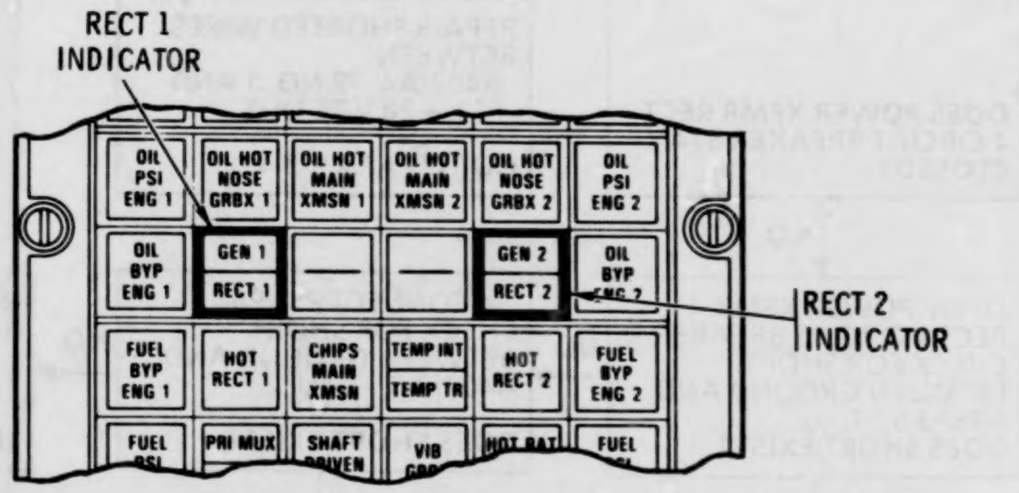
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Accessing provisions L200 panel - removed
	Electrical power distribution box cover removed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

CHECK FOR 28 VDC AT TRANSFORMER/RECTIFIER NO. 1 (T/R 1) POSITIVE (+) OUT PUT TERMINAL.
IS VOLTAGE PRESENT?

- YES: CHECK FOR OPEN BETWEEN T/R 1 POS (+) OUTPUT TERMINAL AND DC CONTACTOR POS (+) INPUT TERMINAL. DOES OPEN EXIST?
  - YES: REPAIR OPEN WIRE. GO TO PARA 9-3-1.
  - NO: DISCONNECT P440 FROM J16. IS RECT 1 INDICATOR LIGHTED?
    - YES: CHECK FOR SHORT TO GROUND BETWEEN P440-B2 AND P18-15. DOES SHORT EXIST?
      - YES: REPAIR SHORTED WIRE. GO TO PARA 9-3-1.
      - NO: GO TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.
    - NO: CHECK FOR SHORT TO GROUND BETWEEN J16-B2 AND P14-7. DOES SHORT EXIST?
      - YES: REPAIR SHORTED WIRE. GO TO PARA 9-3-1.
      - NO: REPLACE DC CONTACTOR ASSEMBLY. TM 55-1520-238-23.
- NO: CHECK FOR OPEN BETWEEN: T/R 1 NEGATIVE (-) TERMINAL AND GS410-A, B P6-D AND GS431-A. DOES OPEN EXIST?
  - YES: REPAIR OPEN WIRE. GO TO PARA 9-3-1.
  - NO: CHECK FOR 115 VAC AT P6-B, -I, AND -F. IS VOLTAGE PRESENT?
    - YES: REPLACE TRANSFORMER/RECTIFIER NO. 1. TM 55-1520-238-23.
    - NO: CHECK FOR 115 VAC AT A76P3-S, -T AND -U. IS VOLTAGE PRESENT?
      - YES: REPAIR OPEN WIRE BETWEEN: A402J3-S AND A402P6-F A402J3-T AND A402-P6-I A402J3-U AND A402P6-B. GO TO PARA 9-3-1.
      - NO: REFER TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.


RECT 1
INDICATOR
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI
PRI MUX
SHAFT DRIVEN
VIB GRB
HOT BAT
FUEL
RECT 2
INDICATOR

PILOT CAUTION/WARNING PANEL

MM04/1-1450

END OF TASK

9-3-9. RECT 2 INDICATOR ON PILOT CAUTION/WARNING PANEL - LIGHTS

Tools: (para 9-3-8)

Personnel Required: (para 9-3-8)

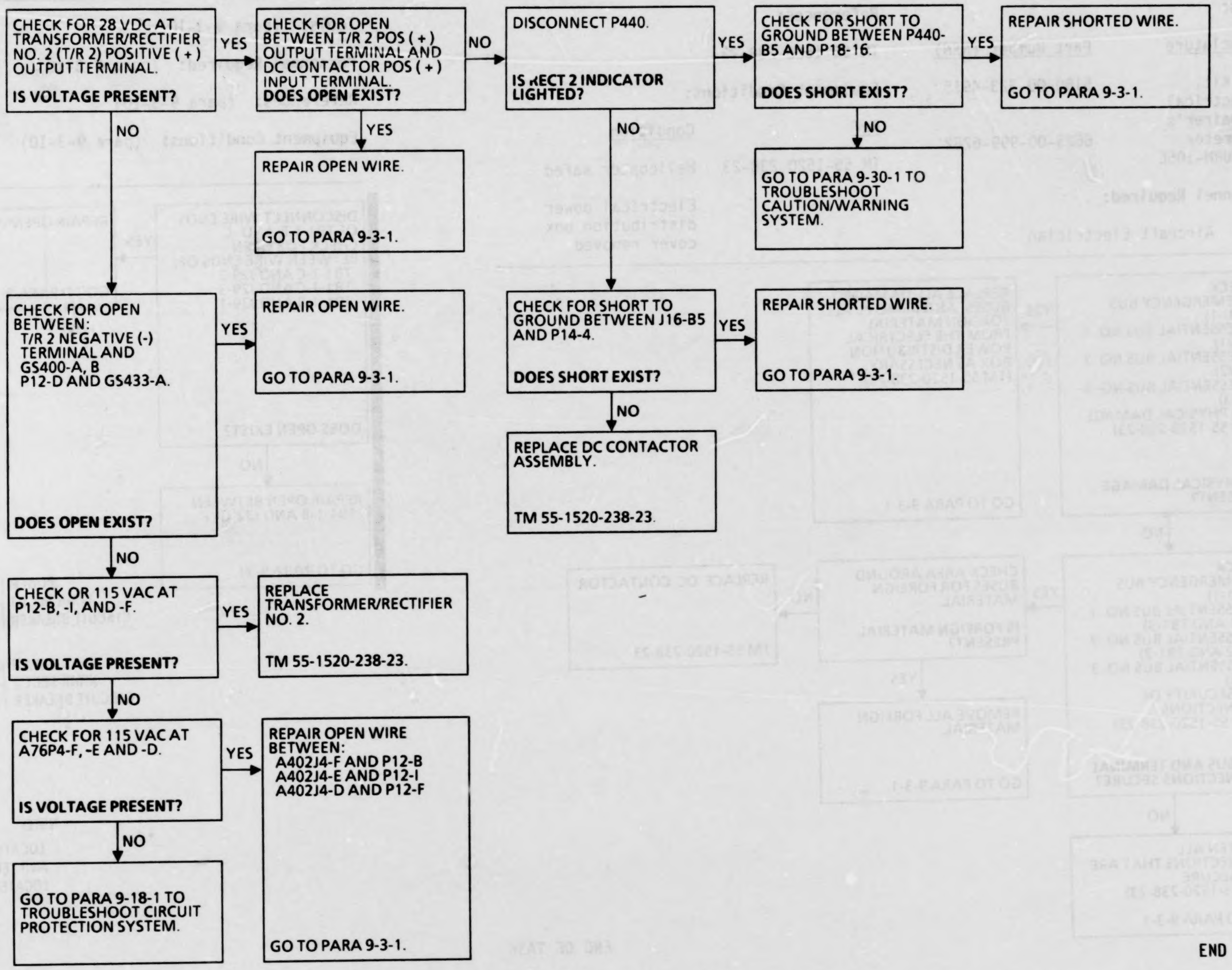
References: (para 9-3-8)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Access provisions R200 panel - removed
	Electrical power distribution box cover removed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT TRANSFORMER/RECTIFIER NO. 2 (T/R 2) POSITIVE (+) OUTPUT TERMINAL. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN T/R 2 POS (+) OUTPUT TERMINAL AND DC CONTACTOR POS (+) INPUT TERMINAL. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-3-1.
NO
DISCONNECT P440. IS RECT 2 INDICATOR LIGHTED?
YES
CHECK FOR SHORT TO GROUND BETWEEN P440-B5 AND P18-16. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-3-1.
NO
GO TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.
NO
CHECK FOR SHORT TO GROUND BETWEEN J16-B5 AND P14-4. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-3-1.
NO
REPLACE DC CONTACTOR ASSEMBLY. TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN: T/R 2 NEGATIVE (-) TERMINAL AND GS400-A, B P12-D AND GS433-A. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-3-1.
NO
CHECK OR 115 VAC AT P12-B, -I, AND -F. IS VOLTAGE PRESENT?
YES
REPLACE TRANSFORMER/RECTIFIER NO. 2. TM 55-1520-238-23.
NO
CHECK FOR 115 VAC AT A76P4-F, -E AND -D. IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN: A402J4-F AND P12-B A402J4-E AND P12-I A402J4-D AND P12-F GO TO PARA 9-3-1.
NO
GO TO PARA 9-18-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

END OF TASK

9-3-10. POWER XFMR RECT 1 AND POWER XFMR RECT 2 CIRCUIT BREAKERS - DO NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter AN/URM-105C	6625-00-999-6282

Personnel Required:

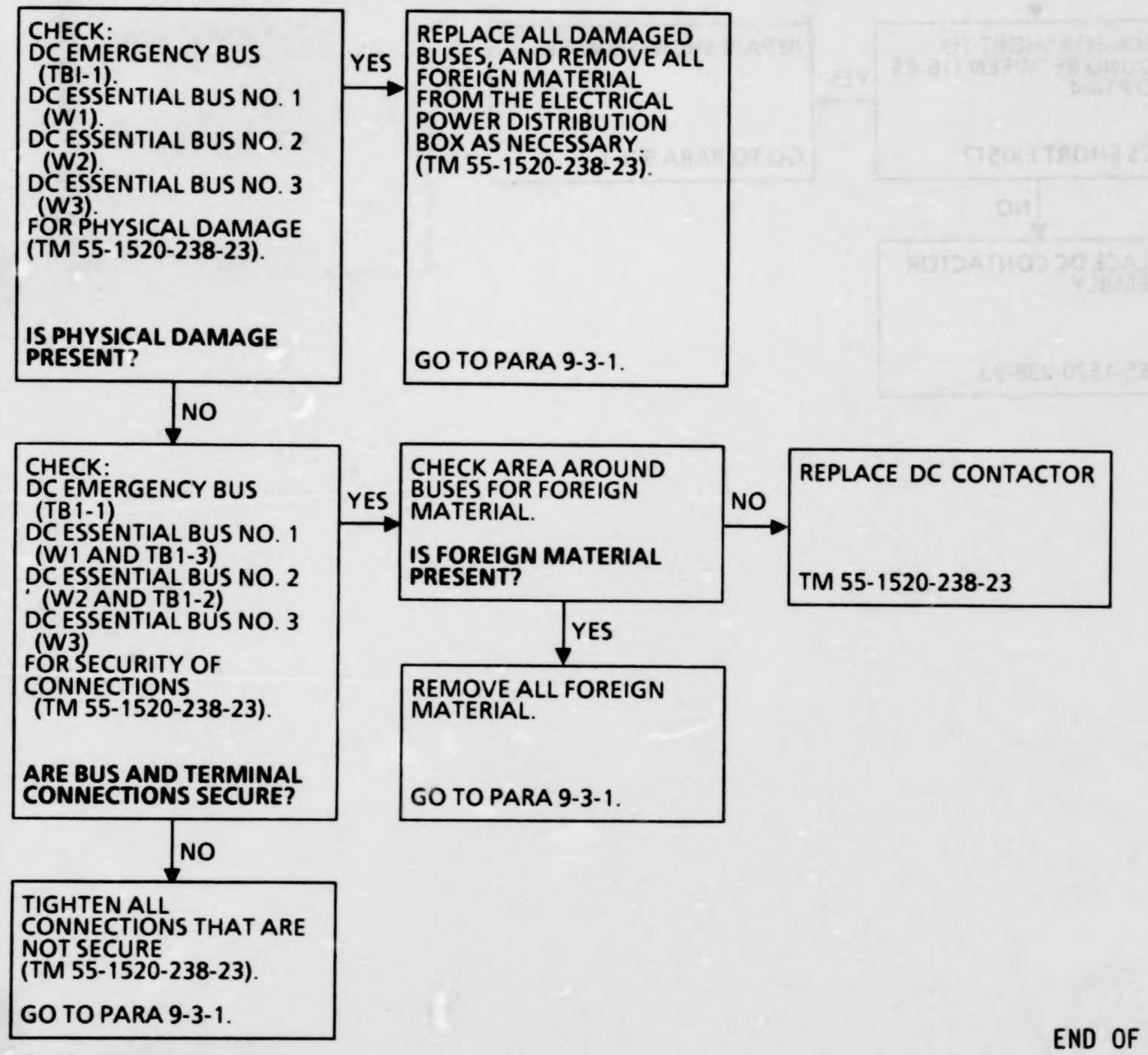
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power distribution box cover removed


CHECK: DC EMERGENCY BUS (TBI-1). DC ESSENTIAL BUS NO. 1 (W1). DC ESSENTIAL BUS NO. 2 (W2). DC ESSENTIAL BUS NO. 3 (W3). FOR PHYSICAL DAMAGE (TM 55-1520-238-23).

IS PHYSICAL DAMAGE PRESENT?

YES: REPLACE ALL DAMAGED BUSES, AND REMOVE ALL FOREIGN MATERIAL FROM THE ELECTRICAL POWER DISTRIBUTION BOX AS NECESSARY. (TM 55-1520-238-23). GO TO PARA 9-3-1.

NO: CHECK: DC EMERGENCY BUS (TB1-1) DC ESSENTIAL BUS NO. 1 (W1 AND TB1-3) DC ESSENTIAL BUS NO. 2 (W2 AND TB1-2) DC ESSENTIAL BUS NO. 3 (W3) FOR SECURITY OF CONNECTIONS (TM 55-1520-238-23).

ARE BUS AND TERMINAL CONNECTIONS SECURE?

NO: TIGHTEN ALL CONNECTIONS THAT ARE NOT SECURE (TM 55-1520-238-23). GO TO PARA 9-3-1.

YES: CHECK AREA AROUND BUSES FOR FOREIGN MATERIAL.

IS FOREIGN MATERIAL PRESENT?

YES: REMOVE ALL FOREIGN MATERIAL. GO TO PARA 9-3-1.

NO: REPLACE DC CONTACTOR TM 55-1520-238-23

END OF TASK

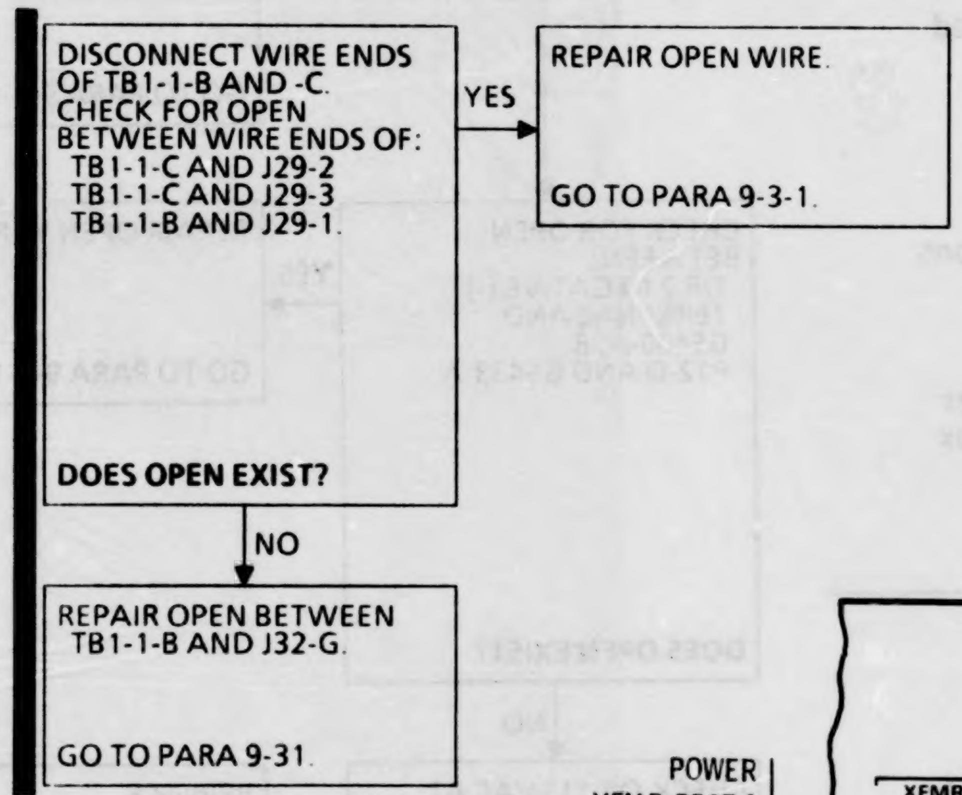
9-3-11. POWER IS NOT AVAILABLE TO ALL DC EMERGENCY BUS CIRCUIT BREAKERS

Tools: (para 9-3-10)

Personnel Required: (para 9-3-10)

References: (para 9-3-10)

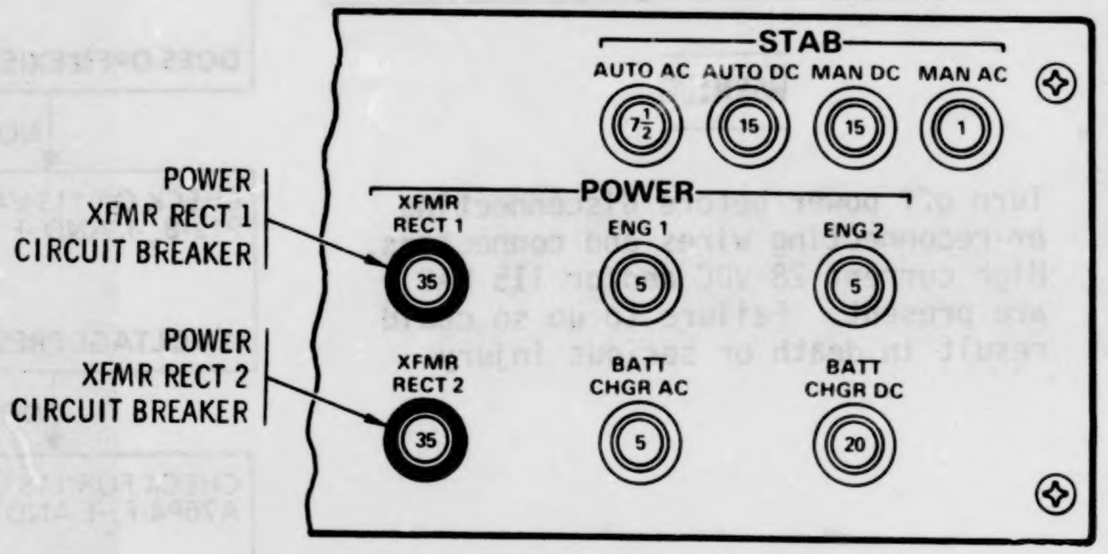
Equipment Conditions: (para 9-3-10)


DISCONNECT WIRE ENDS OF TB1-1-B AND -C. CHECK FOR OPEN BETWEEN WIRE ENDS OF:
TB1-1-C AND J29-2
TB1-1-C AND J29-3
TB1-1-B AND J29-1.

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-3-1.

NO: REPAIR OPEN BETWEEN TB1-1-B AND J32-G. GO TO PARA 9-31.



PILOT CIRCUIT BREAKER PANEL

NOTE:

LOCATION OF D.C. BUSES AND TERMINAL BOARDS ARE LOCATED IN PARA 9-3-3

MM04/1-1420

END OF TASK

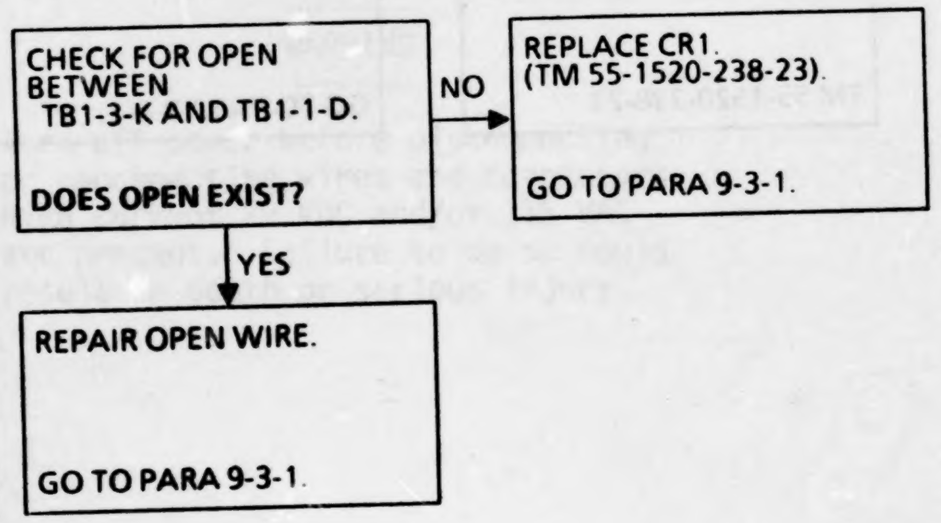
9-3-12. NO CONTINUITY BETWEEN W1 AND TB1-1-D

Tools: (para 9-3-10)

Personnel Required: (para 9-3-10)

References: (para 9-3-10)

Equipment Conditions: (para 9-3-10)


CHECK FOR OPEN BETWEEN TB1-3-K AND TB1-1-D.
DOES OPEN EXIST?
NO
REPLACE CR1 (TM 55-1520-238-23).
GO TO PARA 9-3-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.

END OF TASK

9-3-13. DC ESSENTIAL BUS NO. 1 - HAS NO POWER

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

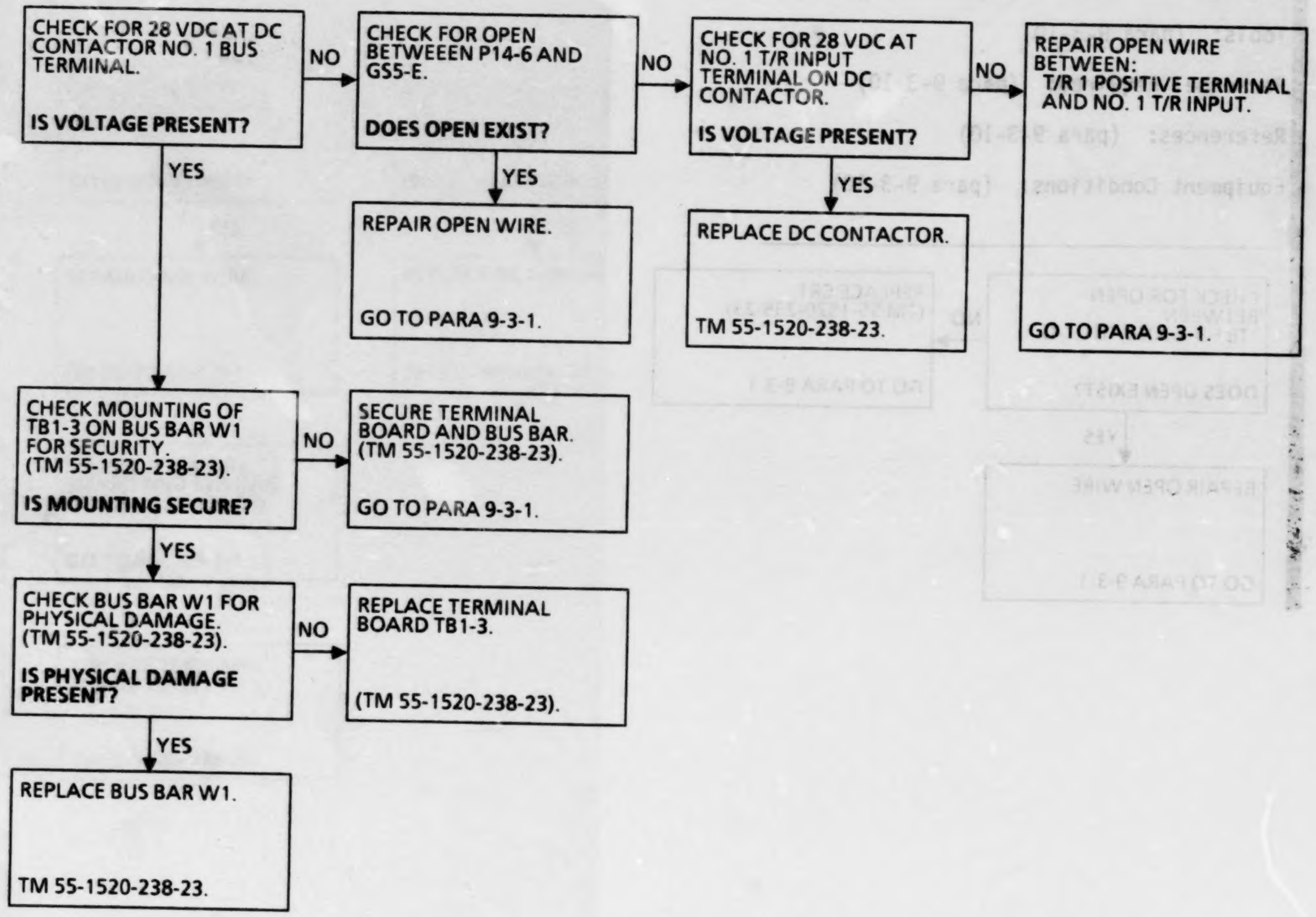
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Electrical power distribution box cover removed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT DC CONTACTOR NO. 1 BUS TERMINAL.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEEN P14-6 AND GS5-E.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT NO. 1 T/R INPUT TERMINAL ON DC CONTACTOR.
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN: T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT.
GO TO PARA 9-3-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23.
YES
CHECK MOUNTING OF TB1-3 ON BUS BAR W1 FOR SECURITY. (TM 55-1520-238-23).
IS MOUNTING SECURE?
NO
SECURE TERMINAL BOARD AND BUS BAR. (TM 55-1520-238-23).
GO TO PARA 9-3-1.
YES
CHECK BUS BAR W1 FOR PHYSICAL DAMAGE. (TM 55-1520-238-23).
IS PHYSICAL DAMAGE PRESENT?
NO
REPLACE TERMINAL BOARD TB1-3.
(TM 55-1520-238-23).
YES
REPLACE BUS BAR W1.
TM 55-1520-238-23.

END OF TASK

9-3-14. DC ESSENTIAL BUS NO. 2 - HAS NO POWER

Tools: (para 9-3-13)

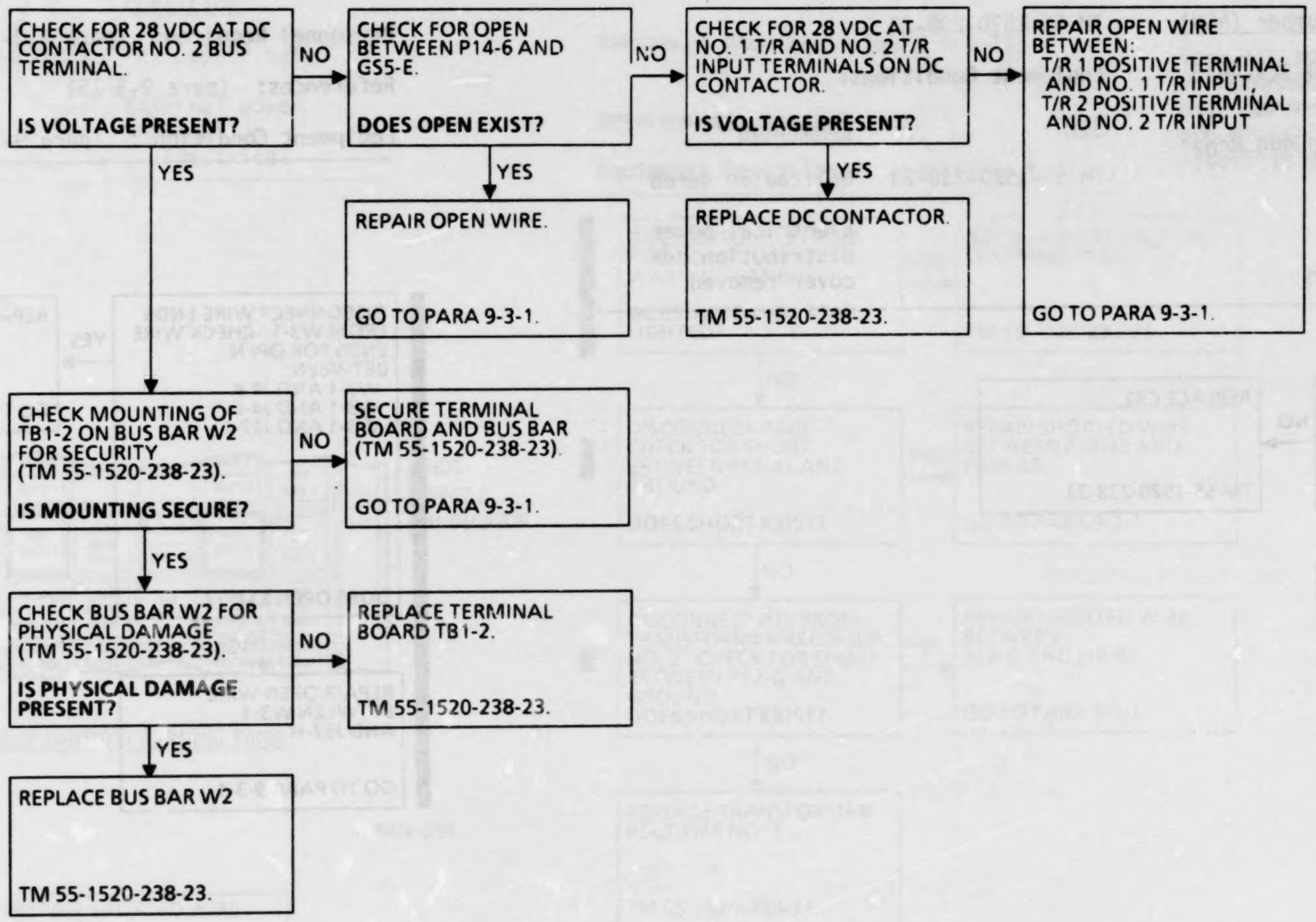
Personnel Required: (para 9-3-13)

References: (para 9-3-13)

Equipment Conditions: (para 9-3-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT DC CONTACTOR NO. 2 BUS TERMINAL.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN P14-6 AND GS5-E.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT NO. 1 T/R AND NO. 2 T/R INPUT TERMINALS ON DC CONTACTOR.
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN:
T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT.
T/R 2 POSITIVE TERMINAL AND NO. 2 T/R INPUT
GO TO PARA 9-3-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23.
YES
CHECK MOUNTING OF TB1-2 ON BUS BAR W2 FOR SECURITY (TM 55-1520-238-23).
IS MOUNTING SECURE?
NO
SECURE TERMINAL BOARD AND BUS BAR (TM 55-1520-238-23).
GO TO PARA 9-3-1.
YES
CHECK BUS BAR W2 FOR PHYSICAL DAMAGE (TM 55-1520-238-23).
IS PHYSICAL DAMAGE PRESENT?
NO
REPLACE TERMINAL BOARD TB1-2.
TM 55-1520-238-23.
YES
REPLACE BUS BAR W2
TM 55-1520-238-23.

END OF TASK

9-3-15. NO CONTINUITY BETWEEN W2 AND TB1-1-D

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter AN/URM-105C	6625-00-999-6282

Personnel Required:

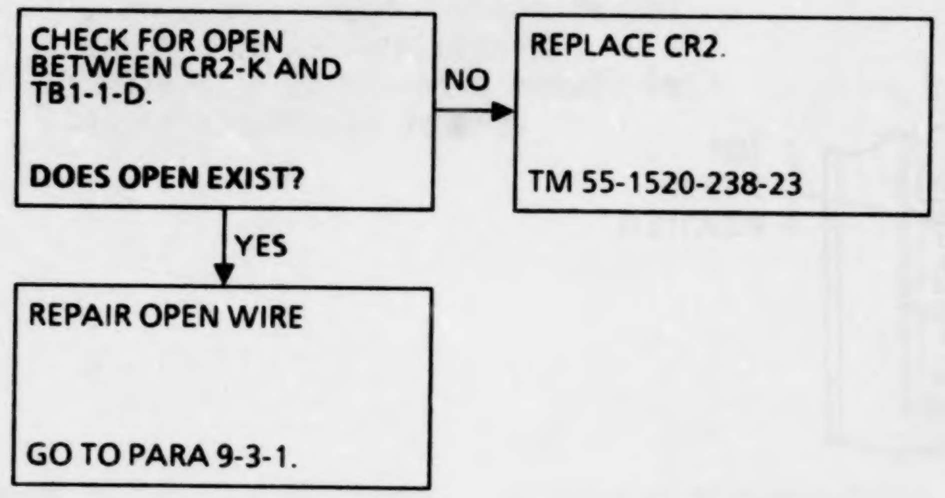
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power distribution box cover removed


CHECK FOR OPEN BETWEEN CR2-K AND TB1-1-D.
DOES OPEN EXIST?
NO
REPLACE CR2.
TM 55-1520-238-23
YES
REPAIR OPEN WIRE
GO TO PARA 9-3-1.

END OF TASK

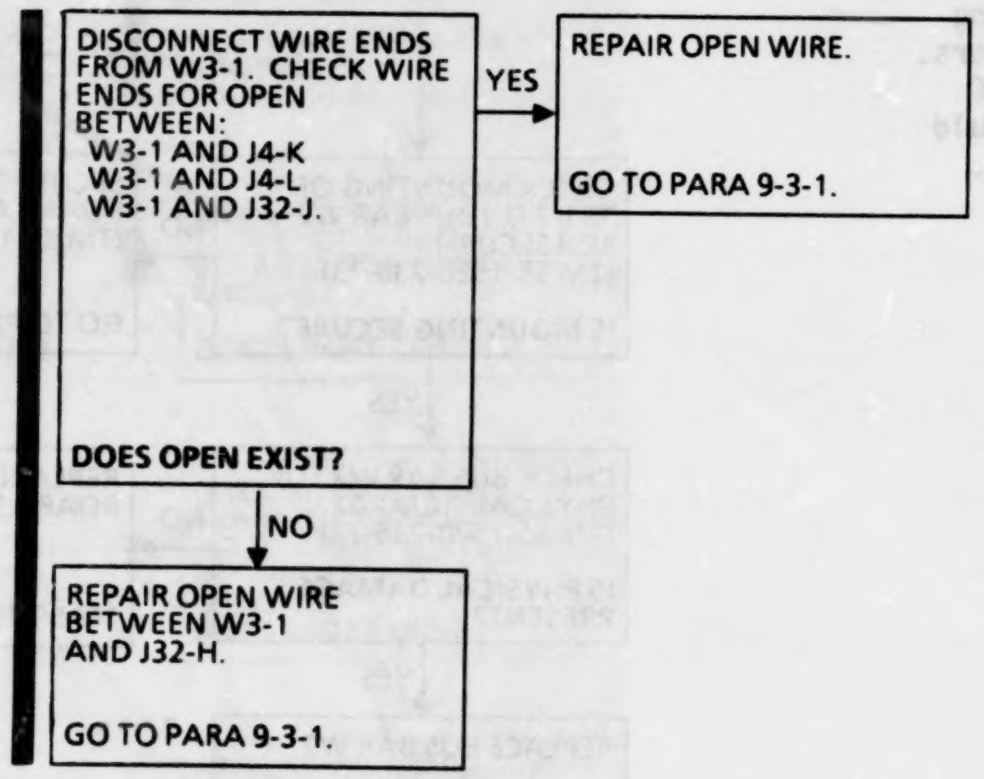
9-3-16. POWER IS NOT AVAILABLE TO ALL DC ESSENTIAL BUS NO. 3 CIRCUIT BREAKERS

Tools: (para 9-3-15)

Personnel Required: (para 9-3-15)

References: (para 9-3-15)

Equipment Conditions: (para 9-3-15)


DISCONNECT WIRE ENDS FROM W3-1. CHECK WIRE ENDS FOR OPEN BETWEEN:
W3-1 AND J4-K
W3-1 AND J4-L
W3-1 AND J32-J.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
REPAIR OPEN WIRE BETWEEN W3-1 AND J32-H.
GO TO PARA 9-3-1.

END OF TASK

9-3-17. HOT RECT 1 INDICATOR - IS LIGHTED

Tools: (para 9-3-15)

Personnel Required: (para 9-3-15)

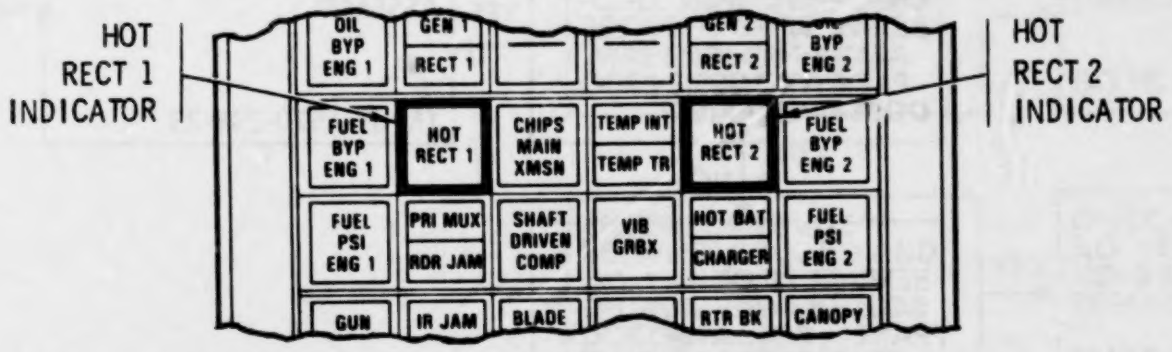
References: (para 9-3-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

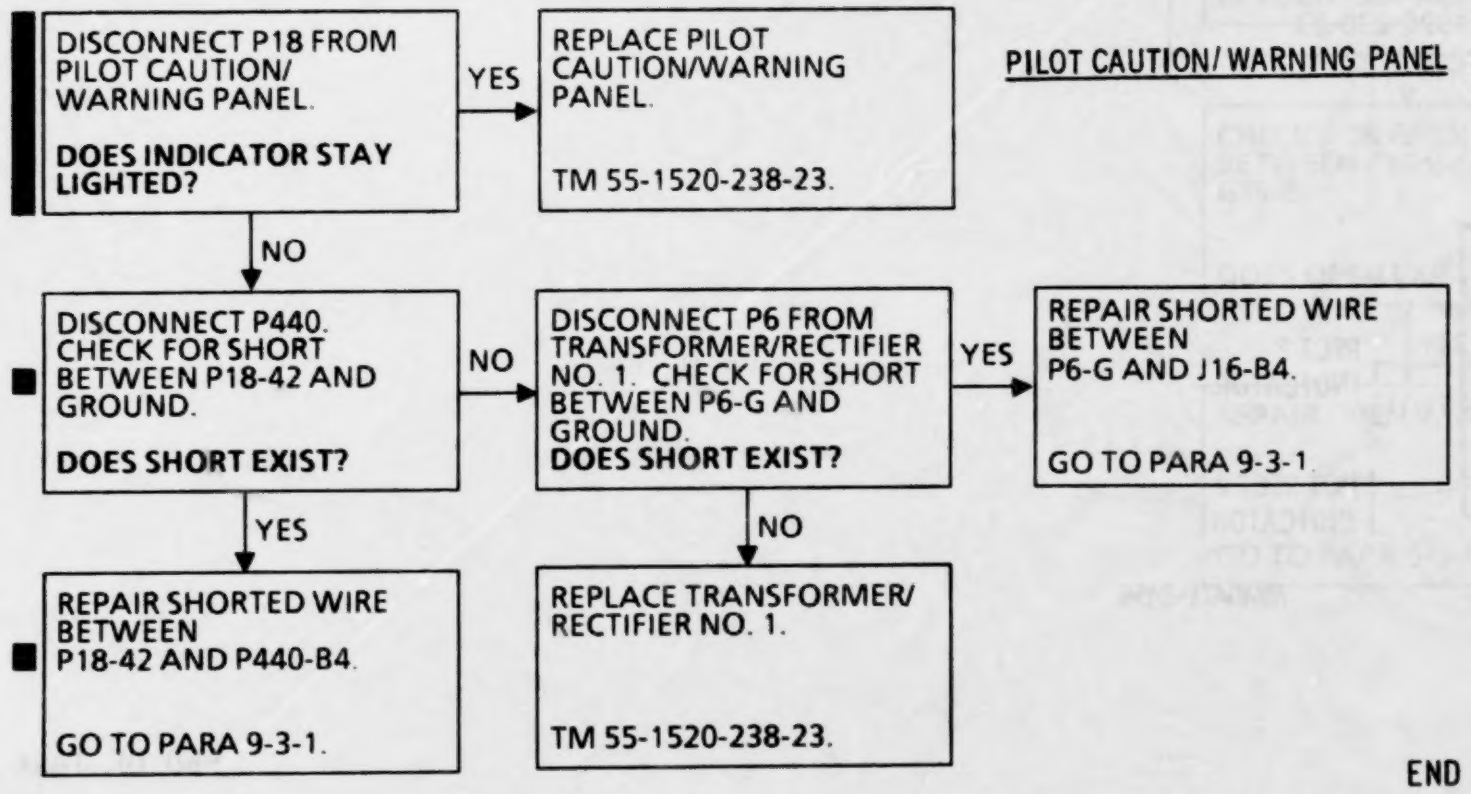
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


HOT RECT 1 INDICATOR
HOT RECT 2 INDICATOR
OIL BYP ENG 1
GEN 1 RECT 1
GEN 2 RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT CHARGER
FUEL PSI ENG 2
GUN
IR JAM
BLADE
RTR BK
CANOPY

PILOT CAUTION/ WARNING PANEL

MM04/1-829A


DISCONNECT P18 FROM PILOT CAUTION/ WARNING PANEL.
DOES INDICATOR STAY LIGHTED?
YES
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
DISCONNECT P440. CHECK FOR SHORT BETWEEN P18-42 AND GROUND.
DOES SHORT EXIST?
NO
DISCONNECT P6 FROM TRANSFORMER/RECTIFIER NO. 1. CHECK FOR SHORT BETWEEN P6-G AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN P6-G AND J16-B4.
GO TO PARA 9-3-1
YES
REPAIR SHORTED WIRE BETWEEN P18-42 AND P440-B4.
GO TO PARA 9-3-1.
NO
REPLACE TRANSFORMER/ RECTIFIER NO. 1.
TM 55-1520-238-23.

END OF TASK

9-3-18. HOT RECT 2 INDICATOR - IS LIGHTED

Tools: (para 9-3-15)

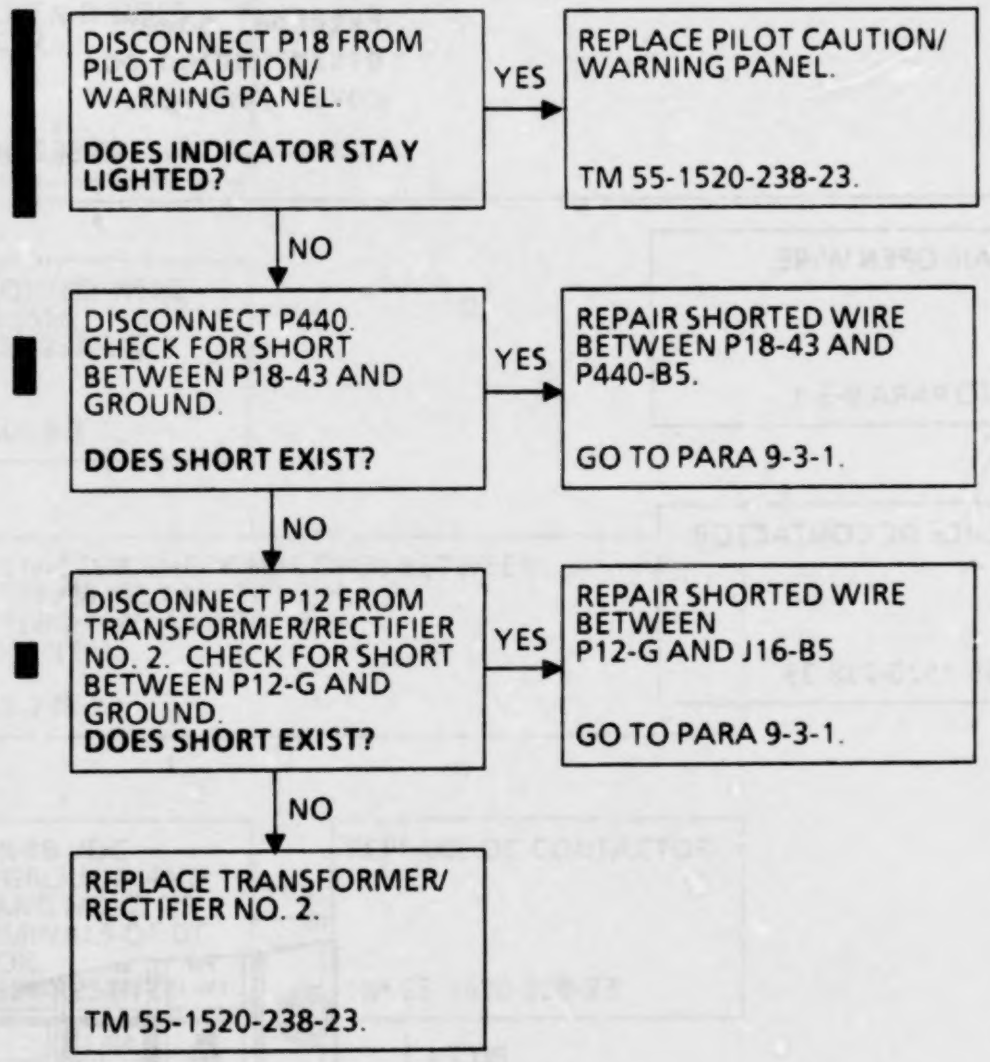
Personnel Required: (para 9-3-15)

References: (para 9-3-15)

Equipment Conditions: (para 9-3-17)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P18 FROM PILOT CAUTION/ WARNING PANEL.
DOES INDICATOR STAY LIGHTED?
YES
REPLACE PILOT CAUTION/ WARNING PANEL.
TM 55-1520-238-23.
NO
DISCONNECT P440. CHECK FOR SHORT BETWEEN P18-43 AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN P18-43 AND P440-B5.
GO TO PARA 9-3-1.
NO
DISCONNECT P12 FROM TRANSFORMER/RECTIFIER NO. 2. CHECK FOR SHORT BETWEEN P12-G AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN P12-G AND J16-B5
GO TO PARA 9-3-1.
NO
REPLACE TRANSFORMER/ RECTIFIER NO. 2.
TM 55-1520-238-23.

END OF TASK

9-3-19. RECT 1 INDICATOR - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

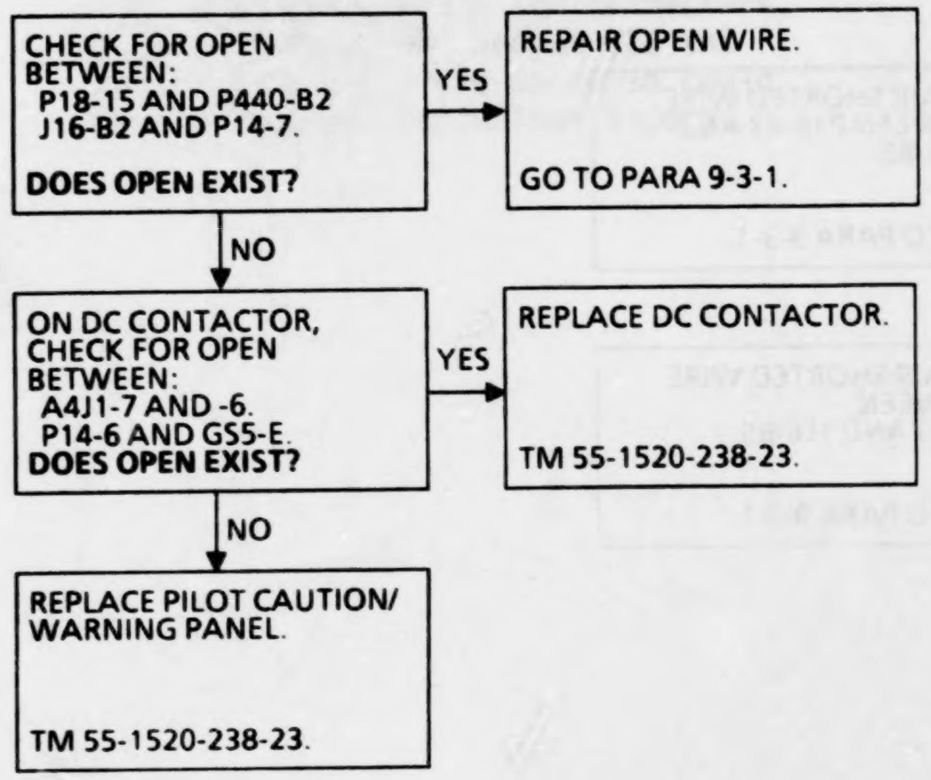
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power distribution box cover removed.


CHECK FOR OPEN BETWEEN:
P18-15 AND P440-B2
J16-B2 AND P14-7.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
ON DC CONTACTOR, CHECK FOR OPEN BETWEEN:
A4J1-7 AND -6.
P14-6 AND GS5-E.
DOES OPEN EXIST?
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23.
NO
REPLACE PILOT CAUTION/ WARNING PANEL.
TM 55-1520-238-23.

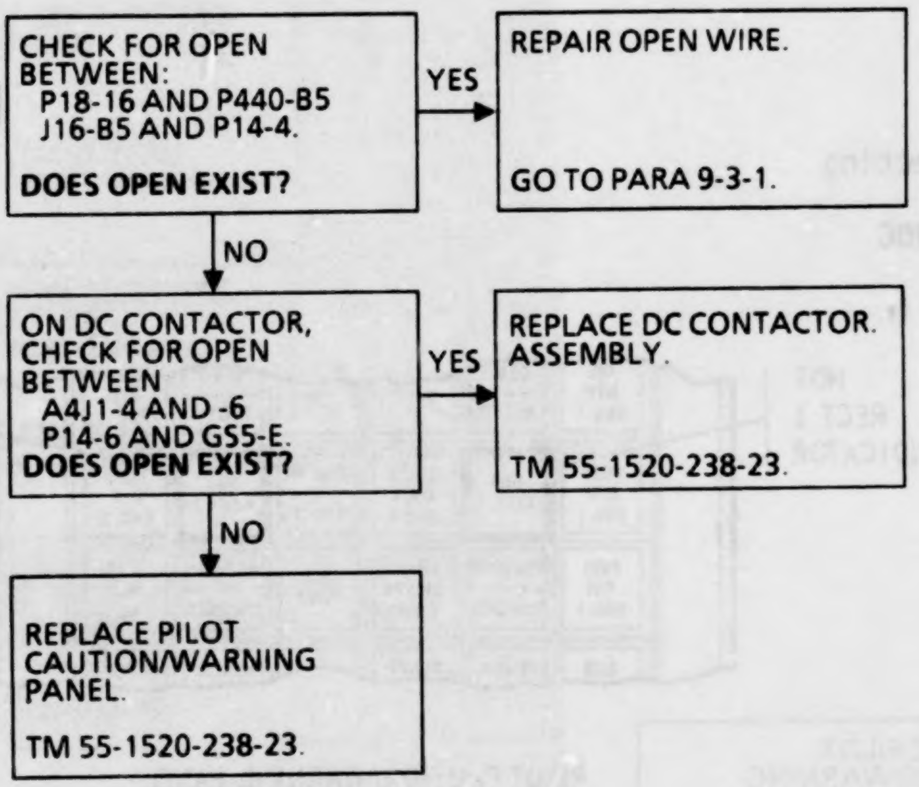
9-3-20. RECT 2 INDICATOR - IS NOT LIGHTED

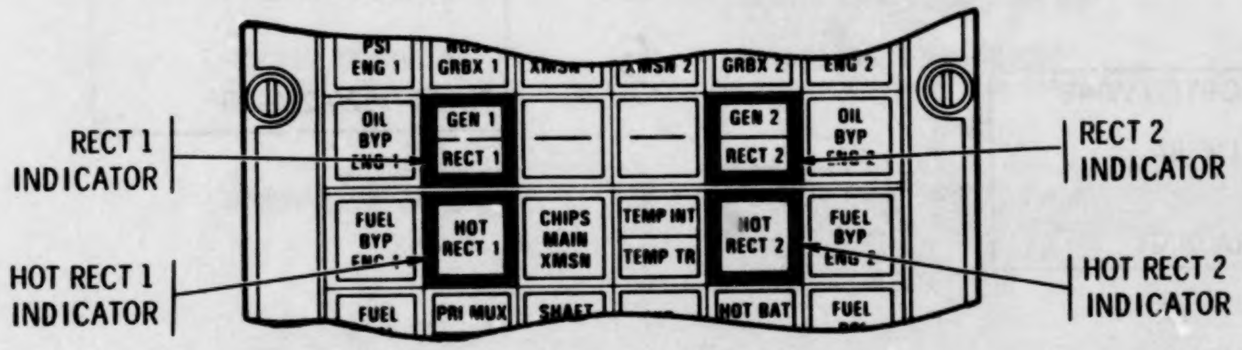
Tools: (para 9-3-19)

Personnel Required: (para 9-3-19)

References: (para 9-3-19)

Equipment Conditions: (para 9-3-19)


CHECK FOR OPEN BETWEEN:
P18-16 AND P440-B5
J16-B5 AND P14-4.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
ON DC CONTACTOR, CHECK FOR OPEN BETWEEN
A4J1-4 AND -6
P14-6 AND GS5-E.
DOES OPEN EXIST?
YES
REPLACE DC CONTACTOR. ASSEMBLY.
TM 55-1520-238-23.
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.


RECT 1 INDICATOR
HOT RECT 1 INDICATOR
RECT 2 INDICATOR
HOT RECT 2 INDICATOR
PSI ENG 1
GRBX 1
GRBX 2
ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL
PRI MUX
HOT BAT
FUEL

PILOT CAUTION / WARNING PANEL

MM04/1-845B

END OF TASK

END OF TASK

(All data on Pages 9-55 thru 9-61 deleted)

9-3-12. EMERGENCY POWER DISTRIBUTION TERMINAL BOARD - HAS NO POWER

Tools: (para 9-3-10)

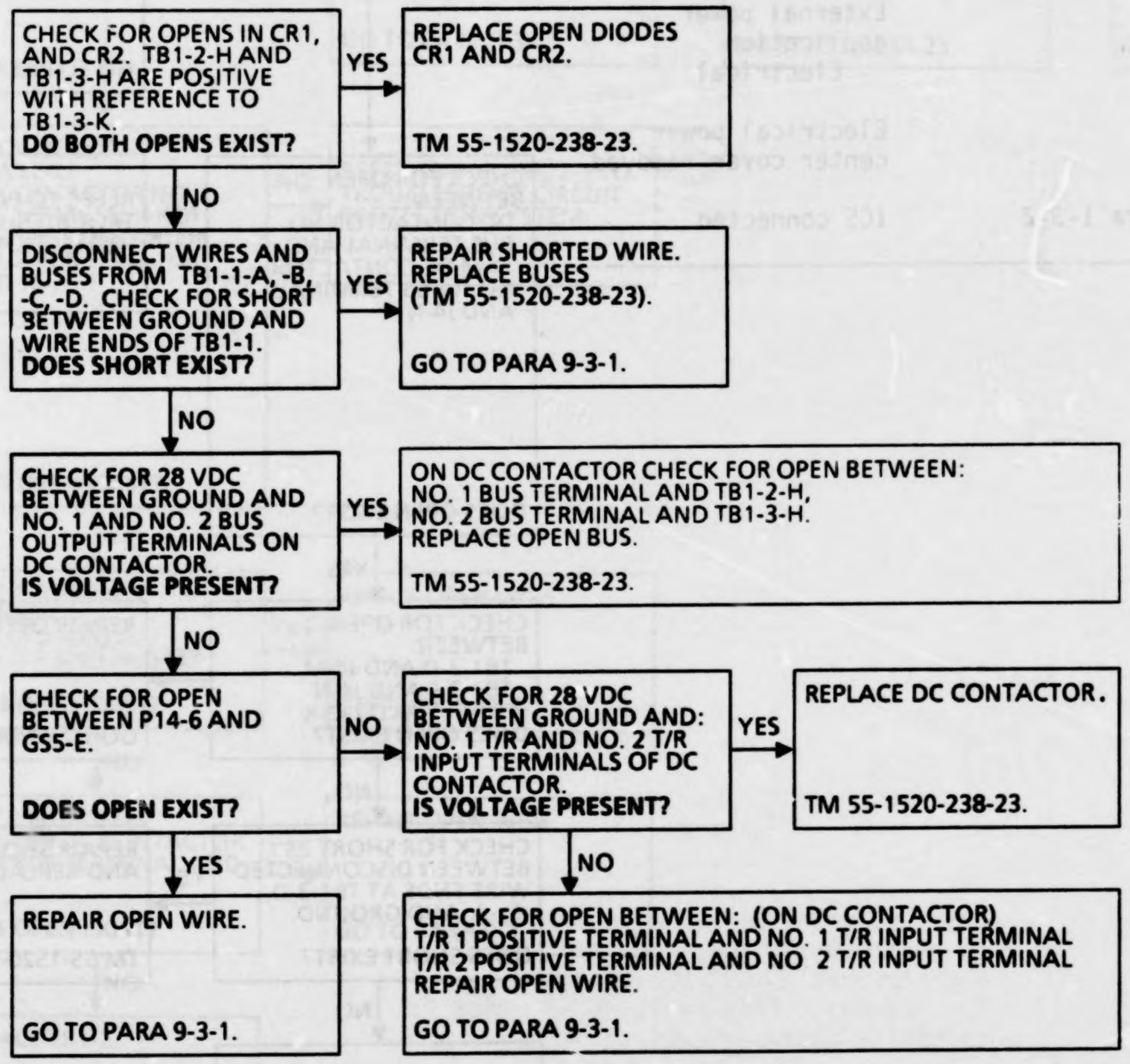
Personnel Required: (para 9-3-10)

References: (para 9-3-10)

Equipment Conditions: (para 9-3-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR OPENS IN CR1, AND CR2. TB1-2-H AND TB1-3-H ARE POSITIVE WITH REFERENCE TO TB1-3-K.
DO BOTH OPENS EXIST?
YES
REPLACE OPEN DIODES CR1 AND CR2.
TM 55-1520-238-23.
NO
DISCONNECT WIRES AND BUSES FROM TB1-1-A, -B, -C, -D. CHECK FOR SHORT BETWEEN GROUND AND WIRE ENDS OF TB1-1.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. REPLACE BUSES (TM 55-1520-238-23).
GO TO PARA 9-3-1.
NO
CHECK FOR 28 VDC BETWEEN GROUND AND NO. 1 AND NO. 2 BUS OUTPUT TERMINALS ON DC CONTACTOR.
IS VOLTAGE PRESENT?
YES
ON DC CONTACTOR CHECK FOR OPEN BETWEEN:
NO. 1 BUS TERMINAL AND TB1-2-H,
NO. 2 BUS TERMINAL AND TB1-3-H.
REPLACE OPEN BUS.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN P14-6 AND GS5-E.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC BETWEEN GROUND AND: NO. 1 T/R AND NO. 2 T/R INPUT TERMINALS OF DC CONTACTOR.
IS VOLTAGE PRESENT?
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
CHECK FOR OPEN BETWEEN: (ON DC CONTACTOR)
T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT TERMINAL
T/R 2 POSITIVE TERMINAL AND NO 2 T/R INPUT TERMINAL
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.

END OF TASK

9-3-13. DC ESSENTIAL BUS NO. 1 (PILOT STATION) - HAS NO POWER

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

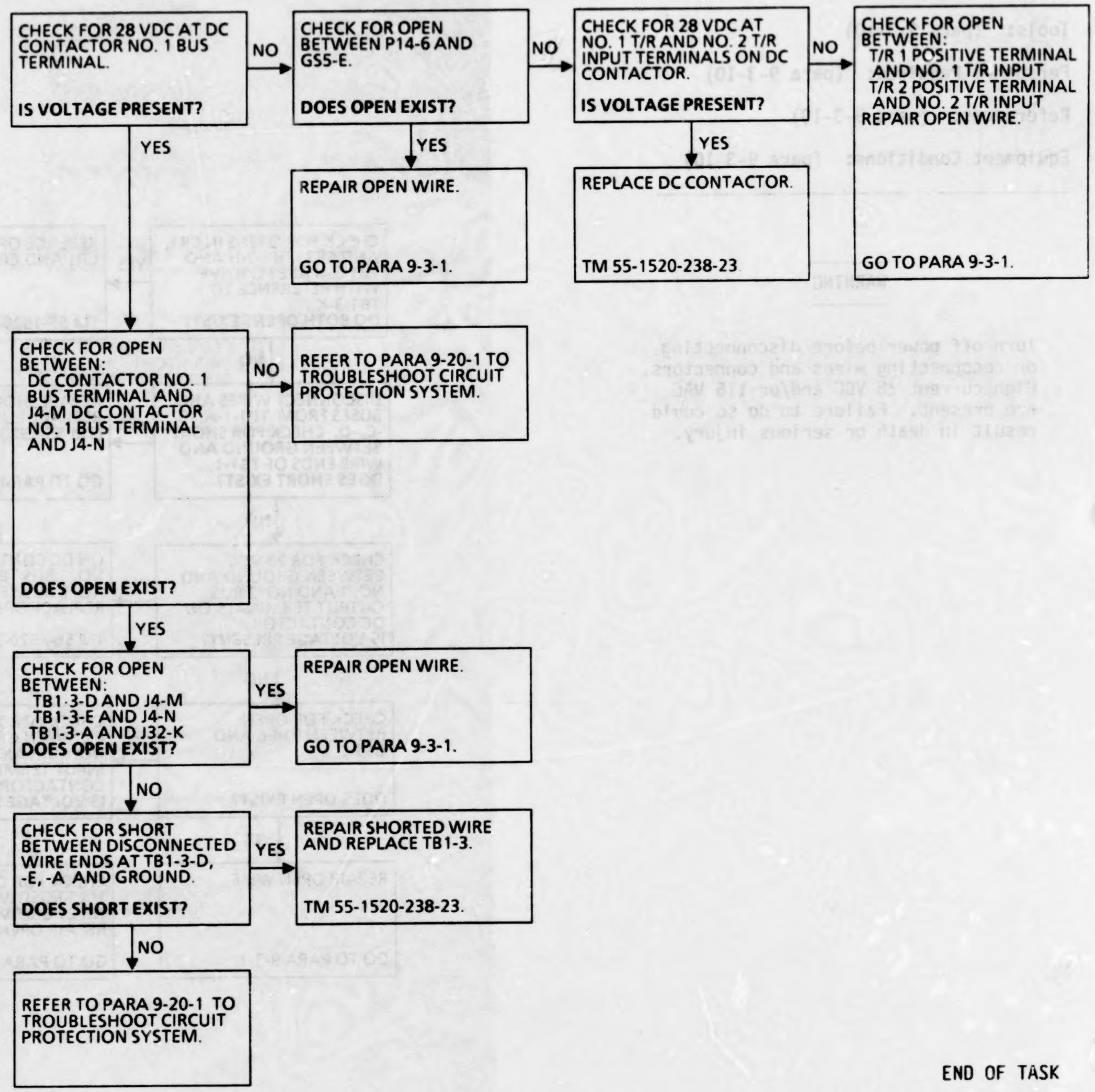
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Electrical power center cover removed
■Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT DC CONTACTOR NO. 1 BUS TERMINAL.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN P14-6 AND GS5-E.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT NO. 1 T/R AND NO. 2 T/R INPUT TERMINALS ON DC CONTACTOR.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN: T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT T/R 2 POSITIVE TERMINAL AND NO. 2 T/R INPUT REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23
YES
CHECK FOR OPEN BETWEEN: DC CONTACTOR NO. 1 BUS TERMINAL AND J4-M DC CONTACTOR NO. 1 BUS TERMINAL AND J4-N
DOES OPEN EXIST?
NO
REFER TO PARA 9-20-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR OPEN BETWEEN: TB1-3-D AND J4-M TB1-3-E AND J4-N TB1-3-A AND J32-K
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
CHECK FOR SHORT BETWEEN DISCONNECTED WIRE ENDS AT TB1-3-D, -E, -A AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE AND REPLACE TB1-3.
TM 55-1520-238-23.
NO
REFER TO PARA 9-20-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

END OF TASK

9-3-14. DC ESSENTIAL BUS NO. 2 (PILOT STATION) - HAS NO POWER

Tools: (para 9-3-13)

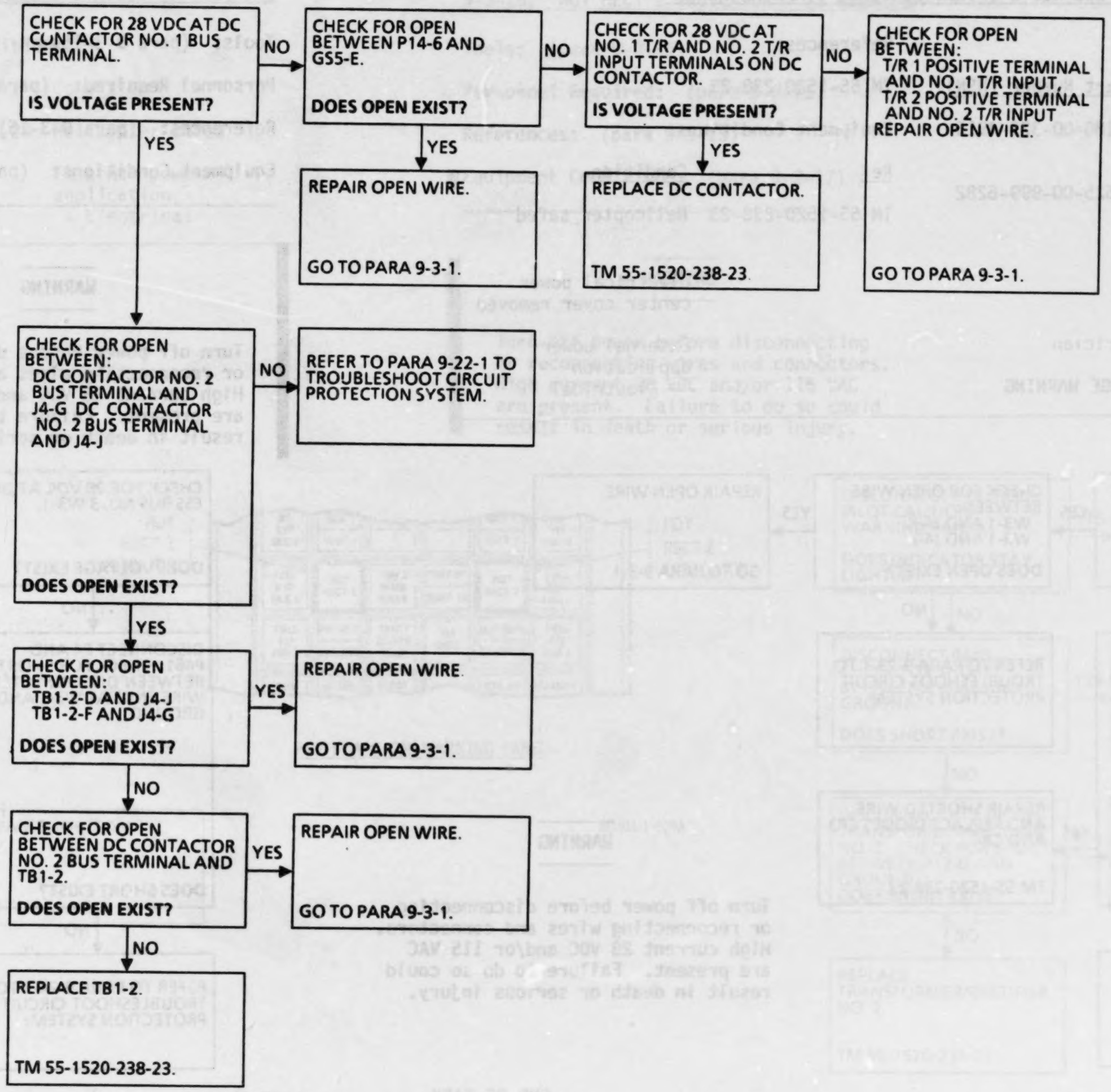
Personnel Required: (para 9-3-13)

References: (para 9-3-13)

Equipment Conditions: (para 9-3-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT DC CONTACTOR NO. 1 BUS TERMINAL.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN P14-6 AND GS5-E.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT NO. 1 T/R AND NO. 2 T/R INPUT TERMINALS ON DC CONTACTOR.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN:
T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT,
T/R 2 POSITIVE TERMINAL AND NO. 2 T/R INPUT
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
CHECK FOR OPEN BETWEEN:
DC CONTACTOR NO. 2 BUS TERMINAL AND J4-G DC CONTACTOR NO. 2 BUS TERMINAL AND J4-J
DOES OPEN EXIST?
NO
REFER TO PARA 9-22-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR OPEN BETWEEN:
TB1-2-D AND J4-J
TB1-2-F AND J4-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
CHECK FOR OPEN BETWEEN DC CONTACTOR NO. 2 BUS TERMINAL AND TB1-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
REPLACE TB1-2.
TM 55-1520-238-23.

END OF TASK

9-3-15. DC ESSENTIAL BUS NO. 3 (PILOT STATION) - HAS NO POWER

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

References:

TM 55-1520-238-23

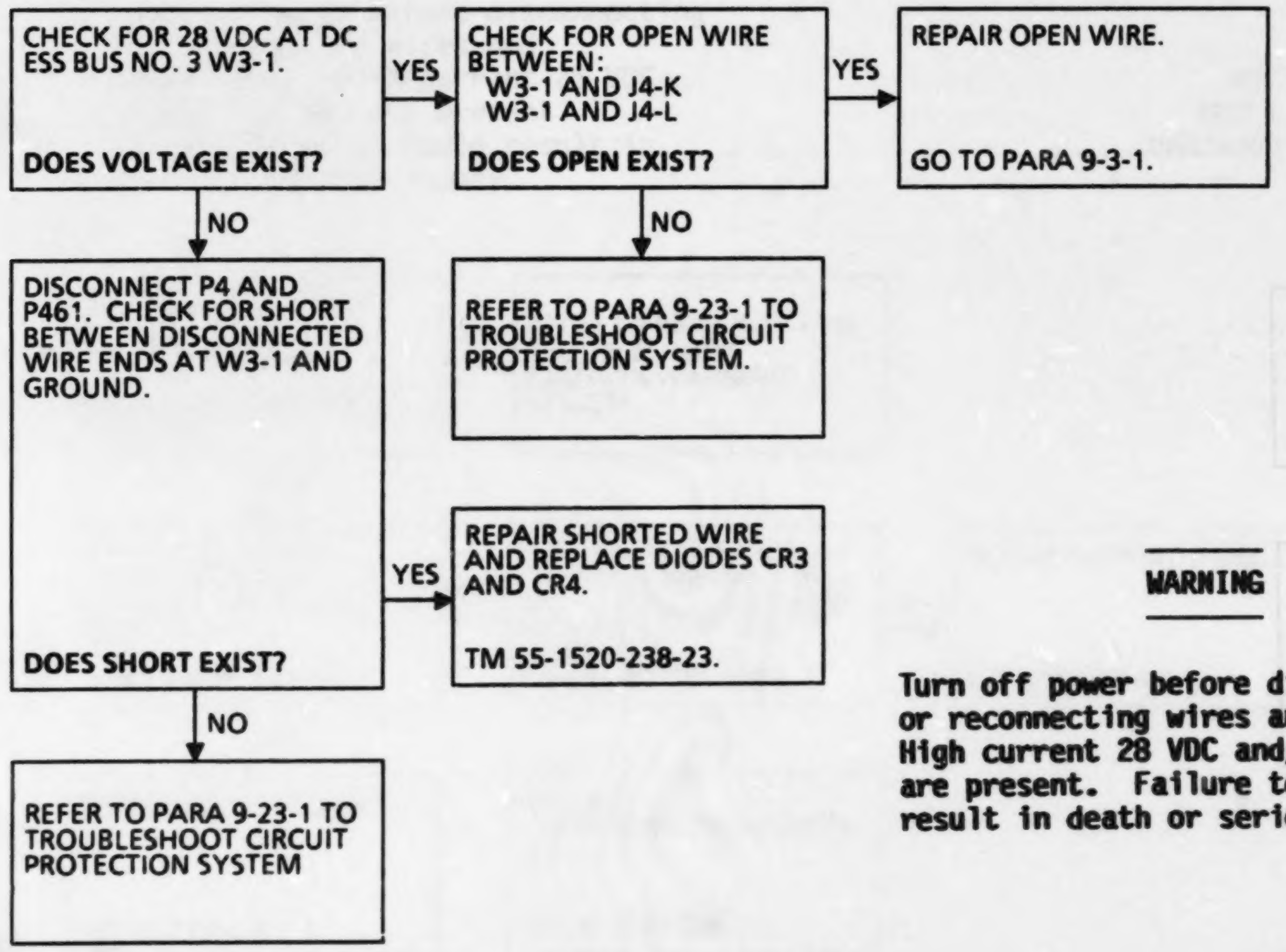
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed
	External power application - Electrical

Personnel Required:

68F10 Aircraft Electrician

REFER TO VOLTAGE WARNING


CHECK FOR 28 VDC AT DC ESS BUS NO. 3 W3-1.
DOES VOLTAGE EXIST?
YES
CHECK FOR OPEN WIRE BETWEEN: W3-1 AND J4-K W3-1 AND J4-L
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
REFER TO PARA 9-23-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT P4 AND P461. CHECK FOR SHORT BETWEEN DISCONNECTED WIRE ENDS AT W3-1 AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE AND REPLACE DIODES CR3 AND CR4.
TM 55-1520-238-23.
NO
REFER TO PARA 9-23-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-3-16. DC ESSENTIAL BUS NO. 3 (CPG STATION) - HAS NO POWER

Tools: (para 9-3-15)

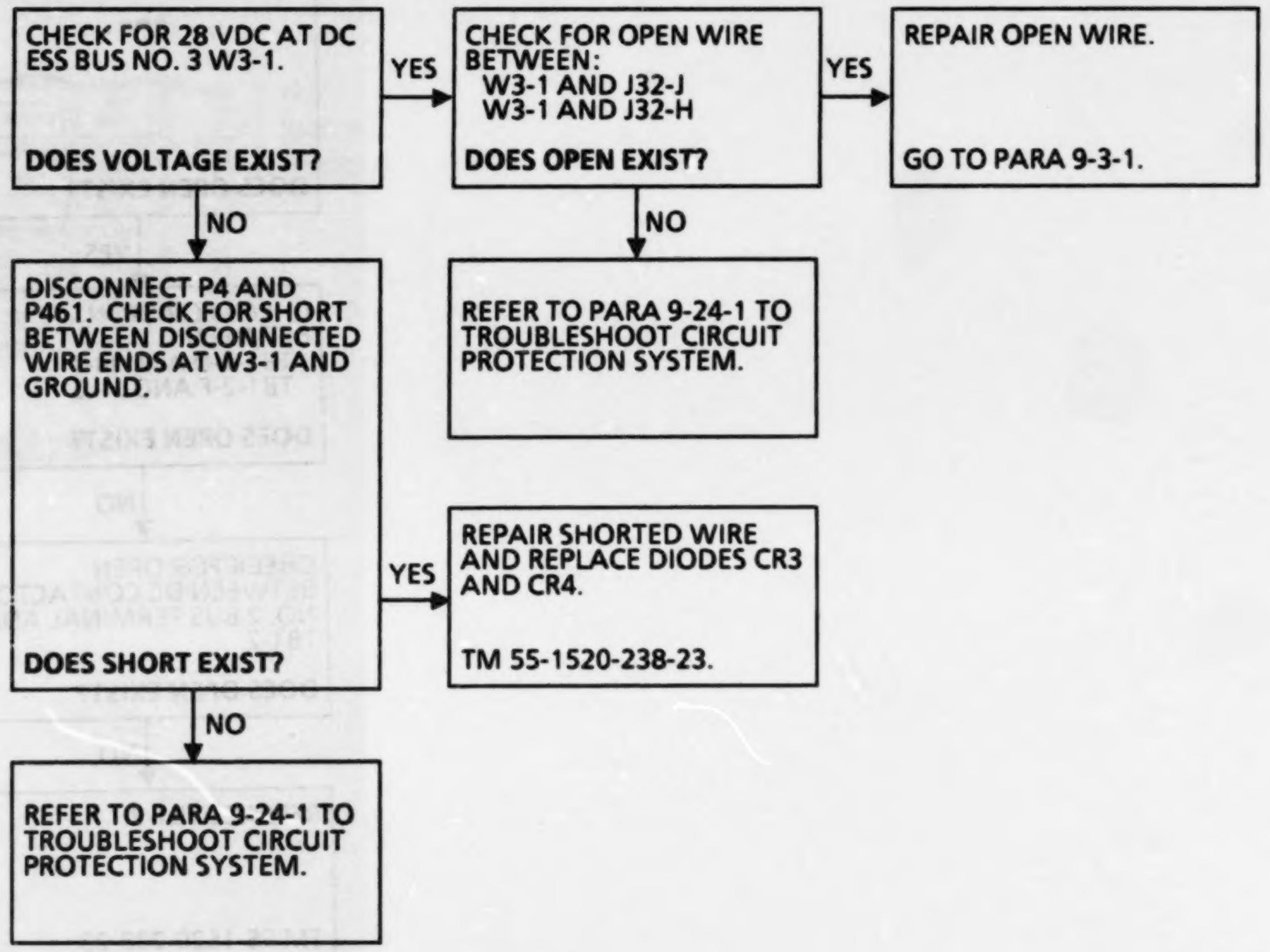
Personnel Required: (para 9-3-15)

References: (para 9-3-15)

Equipment Conditions: (para 9-3-15)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT DC ESS BUS NO. 3 W3-1.
DOES VOLTAGE EXIST?
YES
CHECK FOR OPEN WIRE BETWEEN: W3-1 AND J32-J W3-1 AND J32-H
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
REFER TO PARA 9-24-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT P4 AND P461. CHECK FOR SHORT BETWEEN DISCONNECTED WIRE ENDS AT W3-1 AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE AND REPLACE DIODES CR3 AND CR4.
TM 55-1520-238-23.
NO
REFER TO PARA 9-24-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

END OF TASK

9-3-17. HOT RECT 1 INDICATOR - IS LIGHTED

Tools: (para 9-3-15)

Personnel Required: (para 9-3-15)

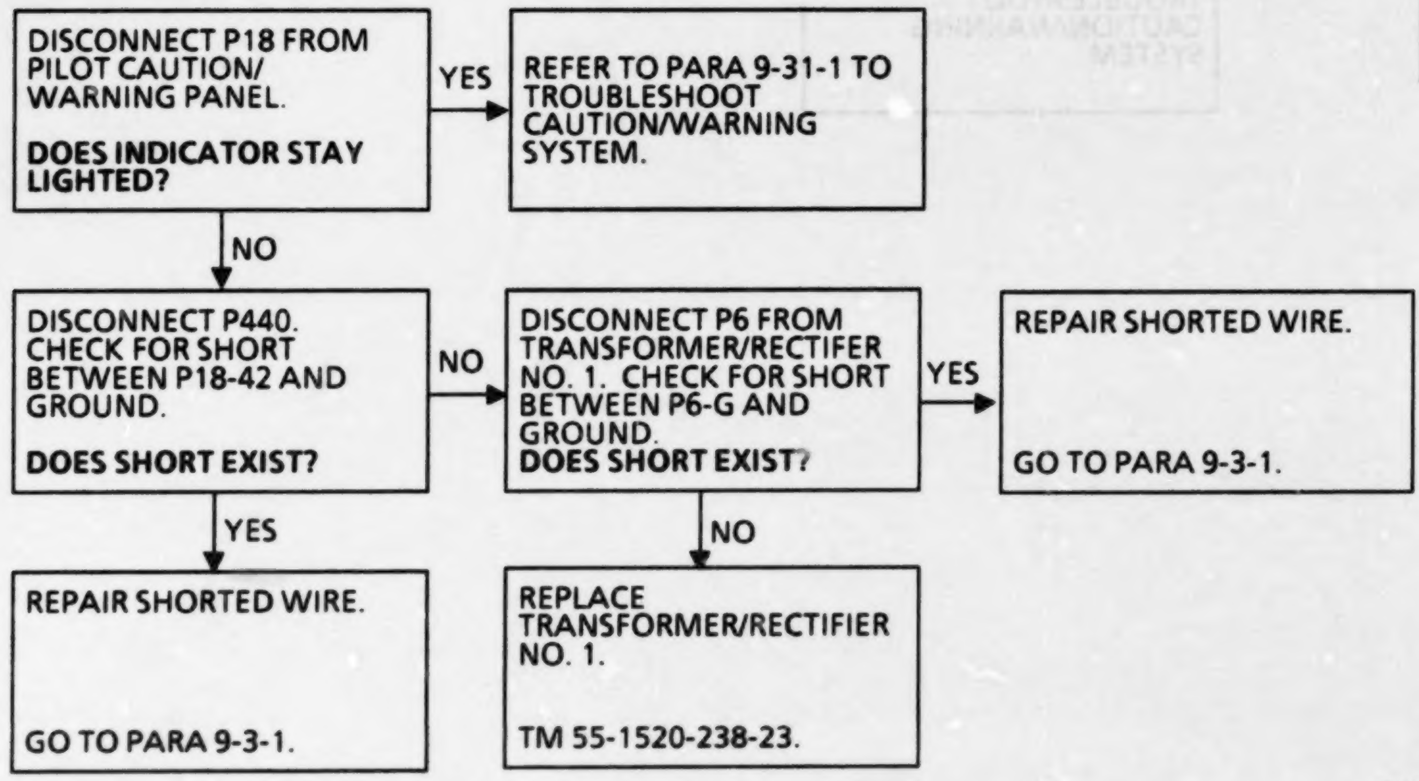
References: (para 9-3-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



DISCONNECT P18 FROM PILOT CAUTION/ WARNING PANEL.
DOES INDICATOR STAY LIGHTED?

YES: REFER TO PARA 9-31-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

NO: DISCONNECT P440. CHECK FOR SHORT BETWEEN P18-42 AND GROUND.
DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE. GO TO PARA 9-3-1.

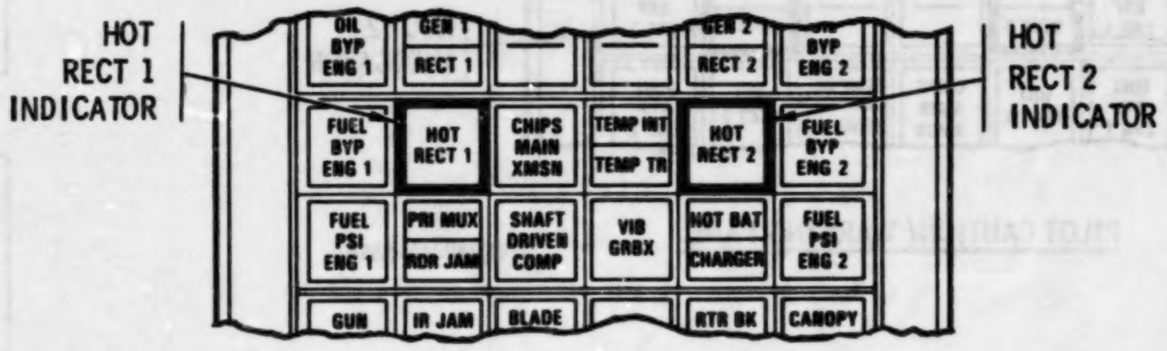
NO: DISCONNECT P6 FROM TRANSFORMER/RECTIFIER NO. 1. CHECK FOR SHORT BETWEEN P6-G AND GROUND.
DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE. GO TO PARA 9-3-1.

NO: REPLACE TRANSFORMER/RECTIFIER NO. 1. TM 55-1520-238-23.

YES
NO
YES
NO
YES
NO

END OF TASK


HOT RECT 1 INDICATOR
HOT RECT 2 INDICATOR
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
IR JAM
BLADE
RTR BK
CANOPY

PILOT CAUTION/ WARNING PANEL

MM04/1-829A

9-3-18. HOT RECT 2 INDICATOR - IS LIGHTED

Tools: (para 9-3-15)

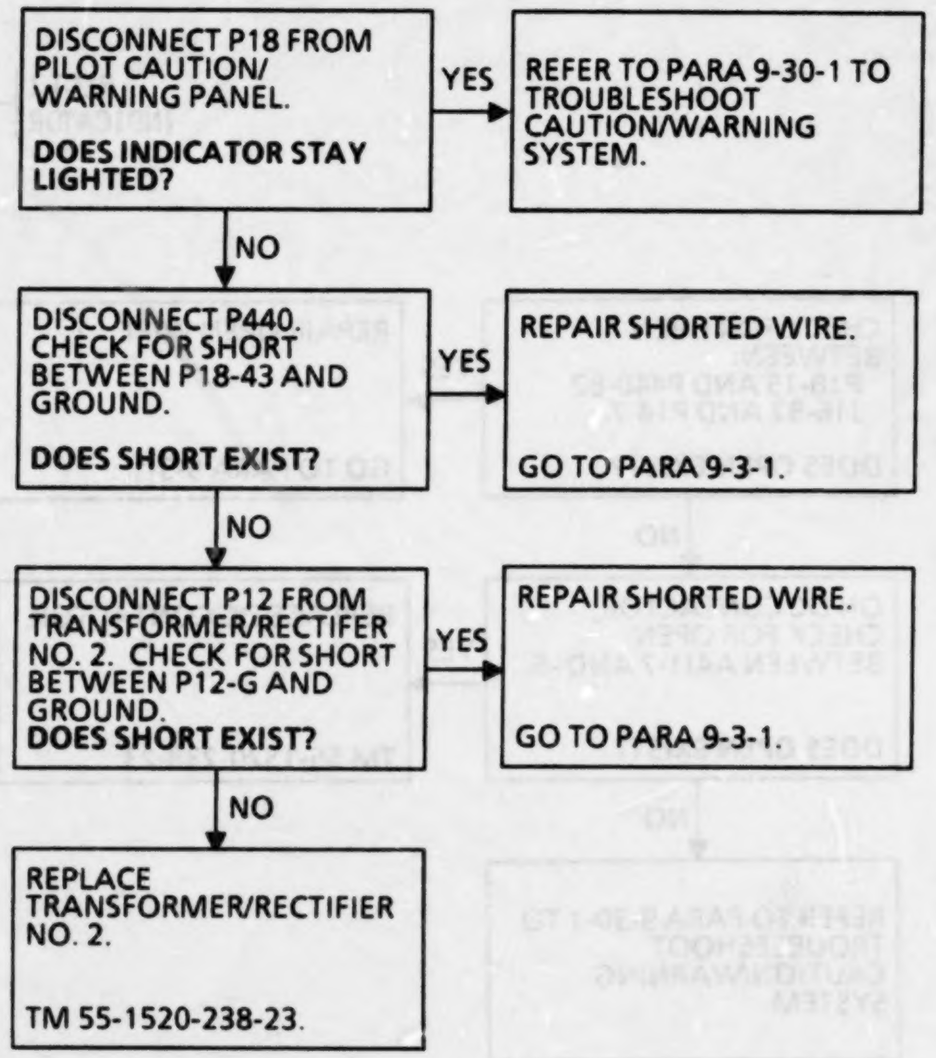
Personnel Required: (para 9-3-15)

References: (para 9-3-15)

Equipment Conditions: (para 9-3-17)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



DISCONNECT P18 FROM PILOT CAUTION/ WARNING PANEL.
DOES INDICATOR STAY LIGHTED?

YES: REFER TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

NO: DISCONNECT P440. CHECK FOR SHORT BETWEEN P18-43 AND GROUND.
DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE. GO TO PARA 9-3-1.

NO: DISCONNECT P12 FROM TRANSFORMER/RECTIFIER NO. 2. CHECK FOR SHORT BETWEEN P12-G AND GROUND.
DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE. GO TO PARA 9-3-1.

NO: REPLACE TRANSFORMER/RECTIFIER NO. 2. TM 55-1520-238-23.

YES
NO
YES
NO
YES
NO

END OF TASK

9-3-19. RECT 1 INDICATOR - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

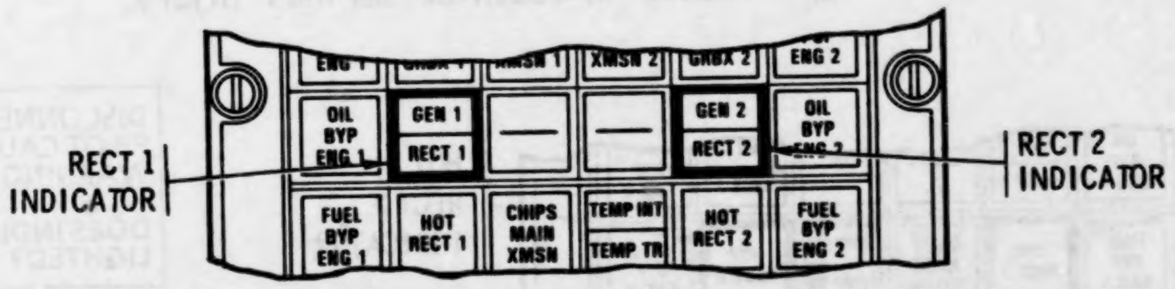
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

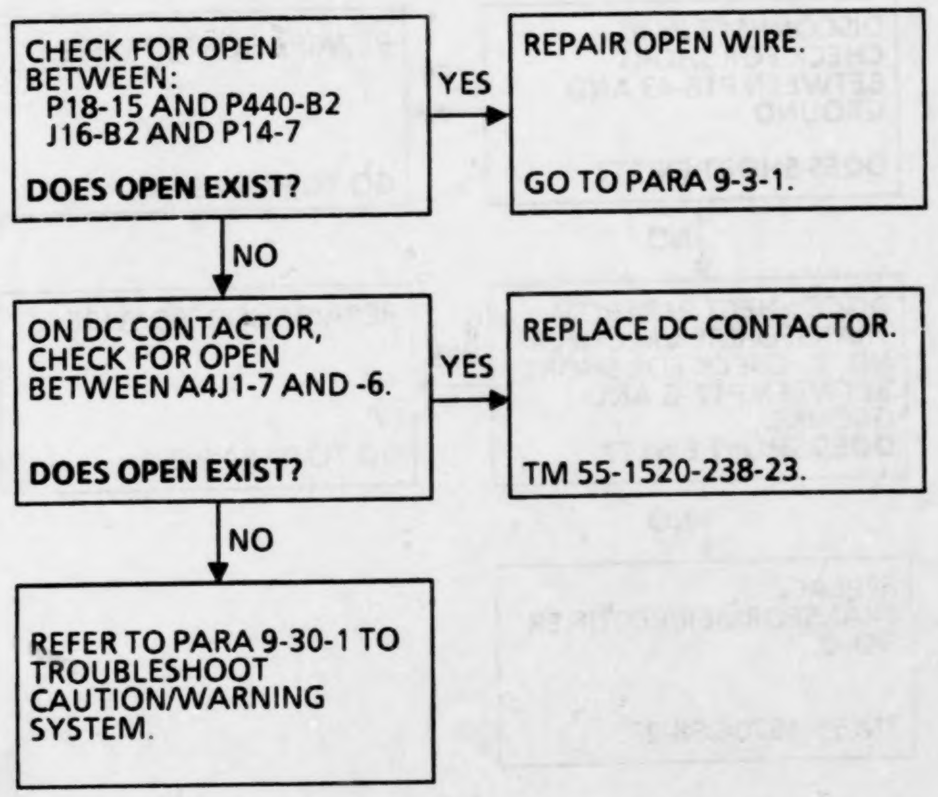
Ref	Condition
TM 55-1520-238-23	Helicopter safed Electrical power center cover removed



RECT 1 INDICATOR
RECT 2 INDICATOR
ENG 2
XMSN 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2

PILOT CAUTION/ WARNING PANEL

MM04/1-845A



CHECK FOR OPEN BETWEEN: P18-15 AND P440-B2 J16-B2 AND P14-7
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
ON DC CONTACTOR, CHECK FOR OPEN BETWEEN A4J1-7 AND -6.
DOES OPEN EXIST?
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23.
NO
REFER TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

END OF TASK

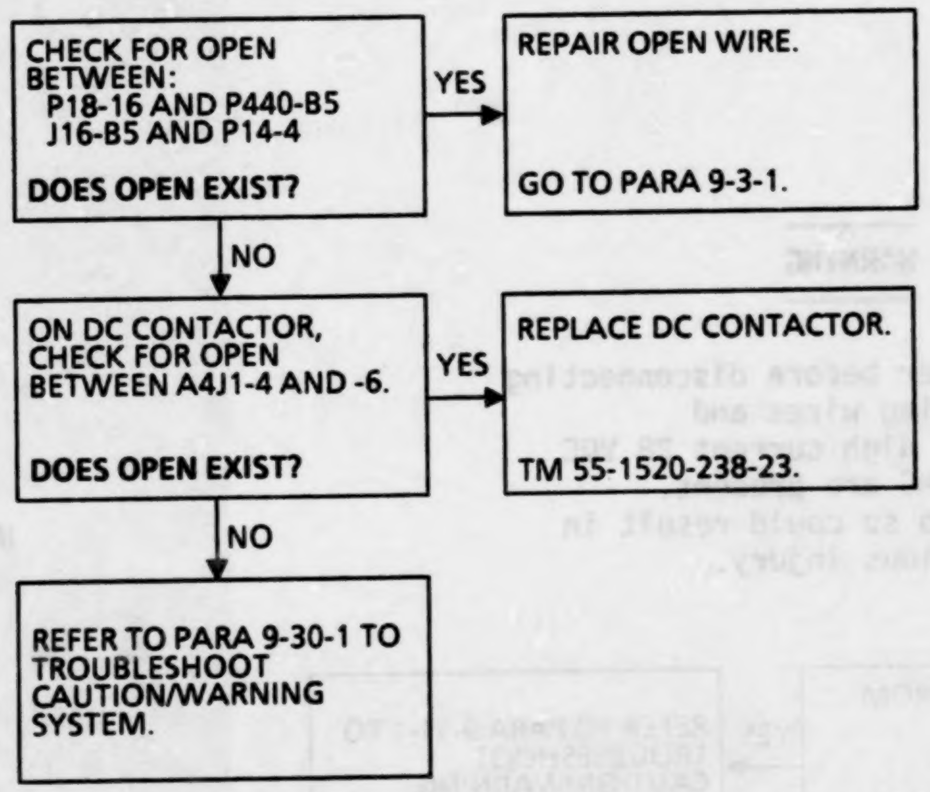
9-3-20. RECT 2 INDICATOR - IS NOT LIGHTED

Tools: (para 9-3-19)

Personnel Required: (para 9-3-19)

References: (para 9-3-19)

Equipment Conditions: (para 9-3-19)



CHECK FOR OPEN BETWEEN: P18-16 AND P440-B5 J16-B5 AND P14-4
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
ON DC CONTACTOR, CHECK FOR OPEN BETWEEN A4J1-4 AND -6.
DOES OPEN EXIST?
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23.
NO
REFER TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

END OF TASK

9-4-1. BATTERY - OPERATIONAL

Tools:

Nomenclature

Tool Kit,
Electrical
Repairer's

Personnel Required:

68F10 Aircraft Electrical

References:

TM 55-1520-238-23
TM 11-1520-238-23-

Equipment Condition:

TM 55-1520-238-

ng indicators are

ter is not lighted,

tor is not lighted,

cator is not
9- 19.

icator is not
9- 20.

indicator is not

END OF TASK

9-4-1. BATTERY - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

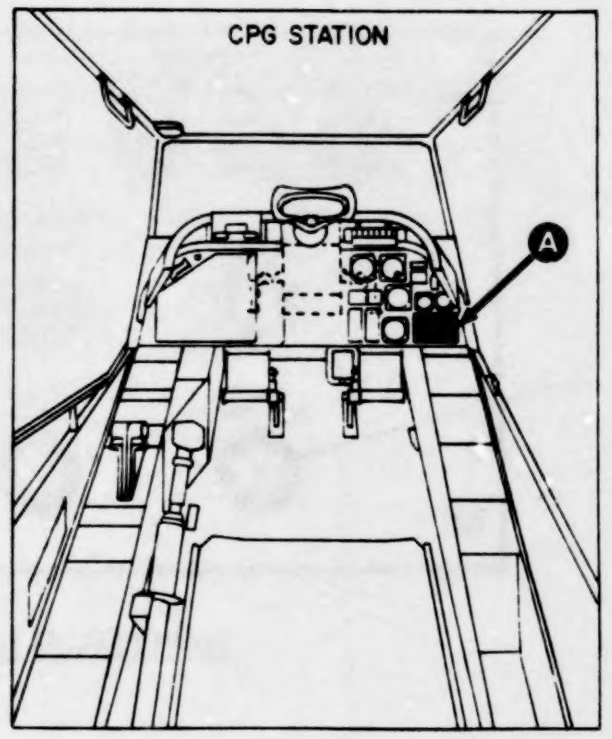
68F10 Aircraft Electrician

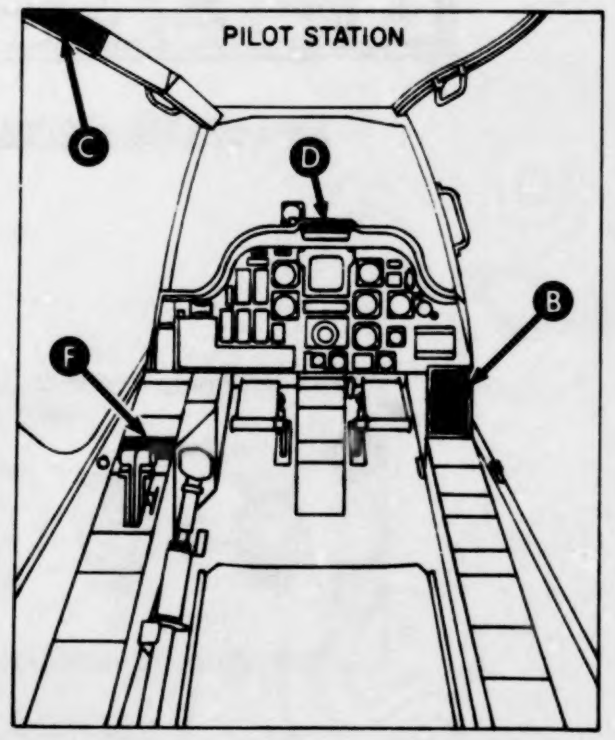
References:

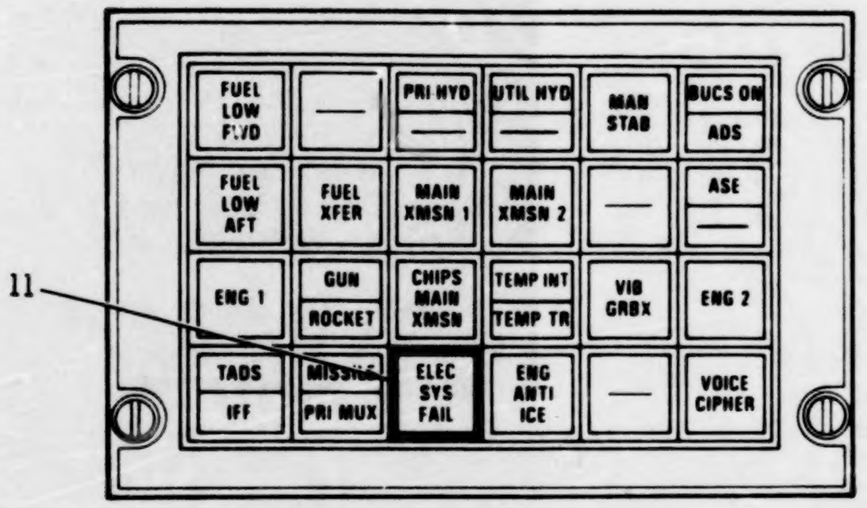
TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

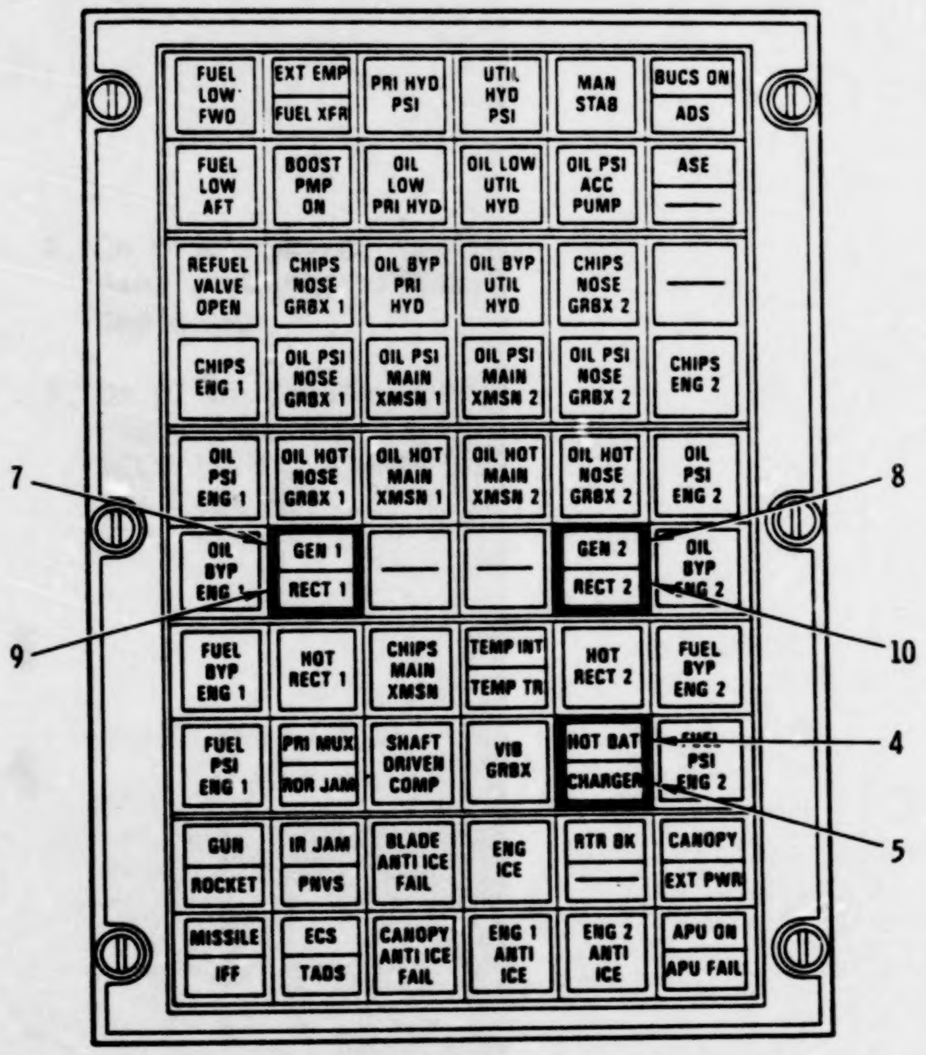
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R295 door opened
	Battery - connected


CPG STATION
A


PILOT STATION
C
D
B
F


FUEL LOW FWD
PRI HYD
UTIL HYD
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
FUEL XFER
MAIN XMSN 1
MAIN XMSN 2
ASE
ENG 1
GUN
ROCKET
CHIPS MAIN XMSN
TEMP INT
TEMP TR
VIB GRBX
ENG 2
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
VOICE CIPHER
11

Ⓐ CPG CAUTION / WARNING PANEL

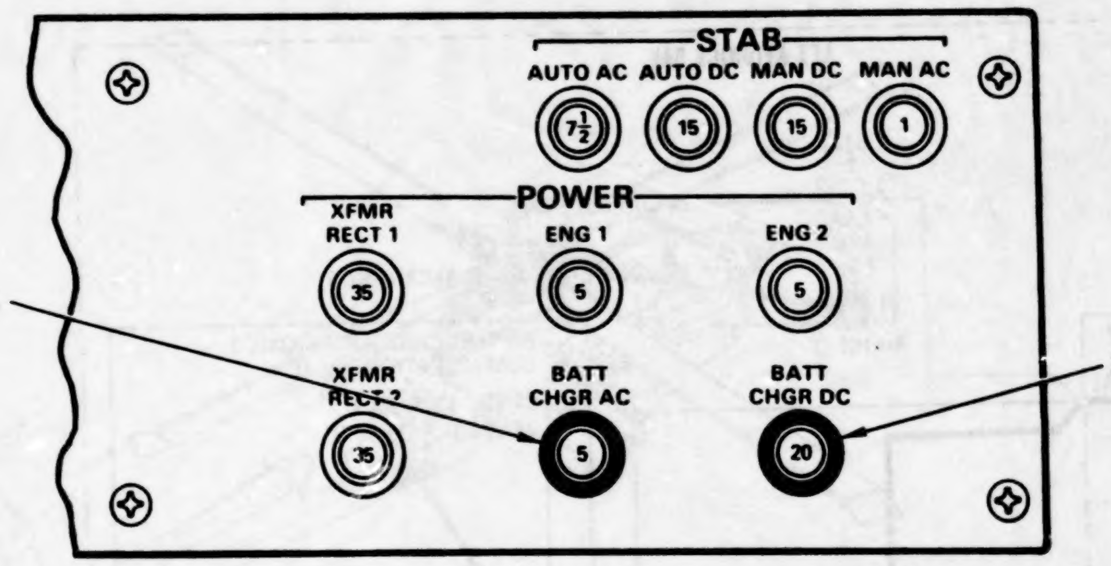

FUEL LOW FWD
EXT EMP
FUEL XFR
PRI HYD PSI
UTIL HYD PSI
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
BOOST PMP ON
OIL LOW PRI HYD
OIL LOW UTIL HYD
OIL PSI ACC PUMP
ASE
REFUEL VALVE OPEN
CHIPS NOSE GRBX 1
OIL BYP PRI HYD
OIL BYP UTIL HYD
CHIPS NOSE GRBX 2
CHIPS ENG 1
OIL PSI NOSE GRBX 1
OIL PSI MAIN XMSN 1
OIL PSI MAIN XMSN 2
OIL PSI NOSE GRBX 2
CHIPS ENG 2
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL
7
8
9
10
4
5

Ⓑ PILOT CAUTION / WARNING PANEL

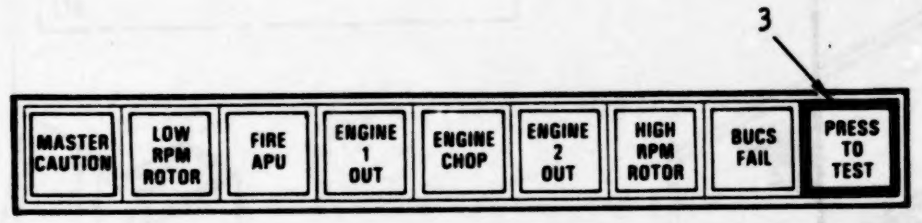
MM04/1-863-1A

GO TO NEXT PAGE

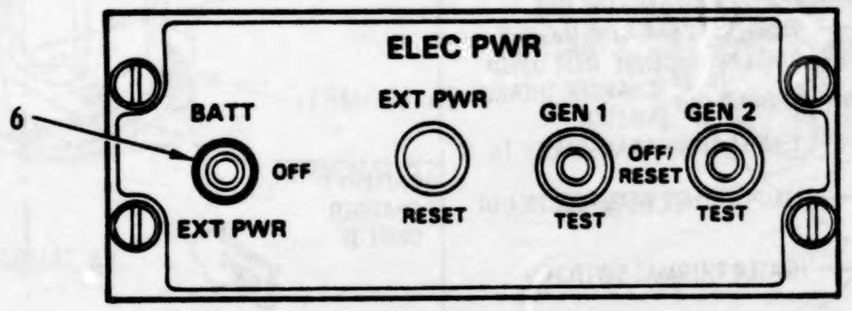
9-4-1. BATTERY - OPERATIONAL CHECK (cont)


STAB
AUTO AC
AUTO DC
MAN DC
MAN AC
7½
15
15
1
POWER
XFMR RECT 1
ENG 1
ENG 2
35
5
5
XFMR RECT 2
BATT CHGR AC
BATT CHGR DC
35
5
20
1
2

C PILOT CIRCUIT BREAKER PANEL


3
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

D PILOT MASTER CAUTION / WARNING PANEL


ELEC PWR
6
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
OFF/ RESET
TEST
GEN 2
TEST

F ELEC PWR PANEL

MM04/1-863-2A

A. Perform operational check as follows:

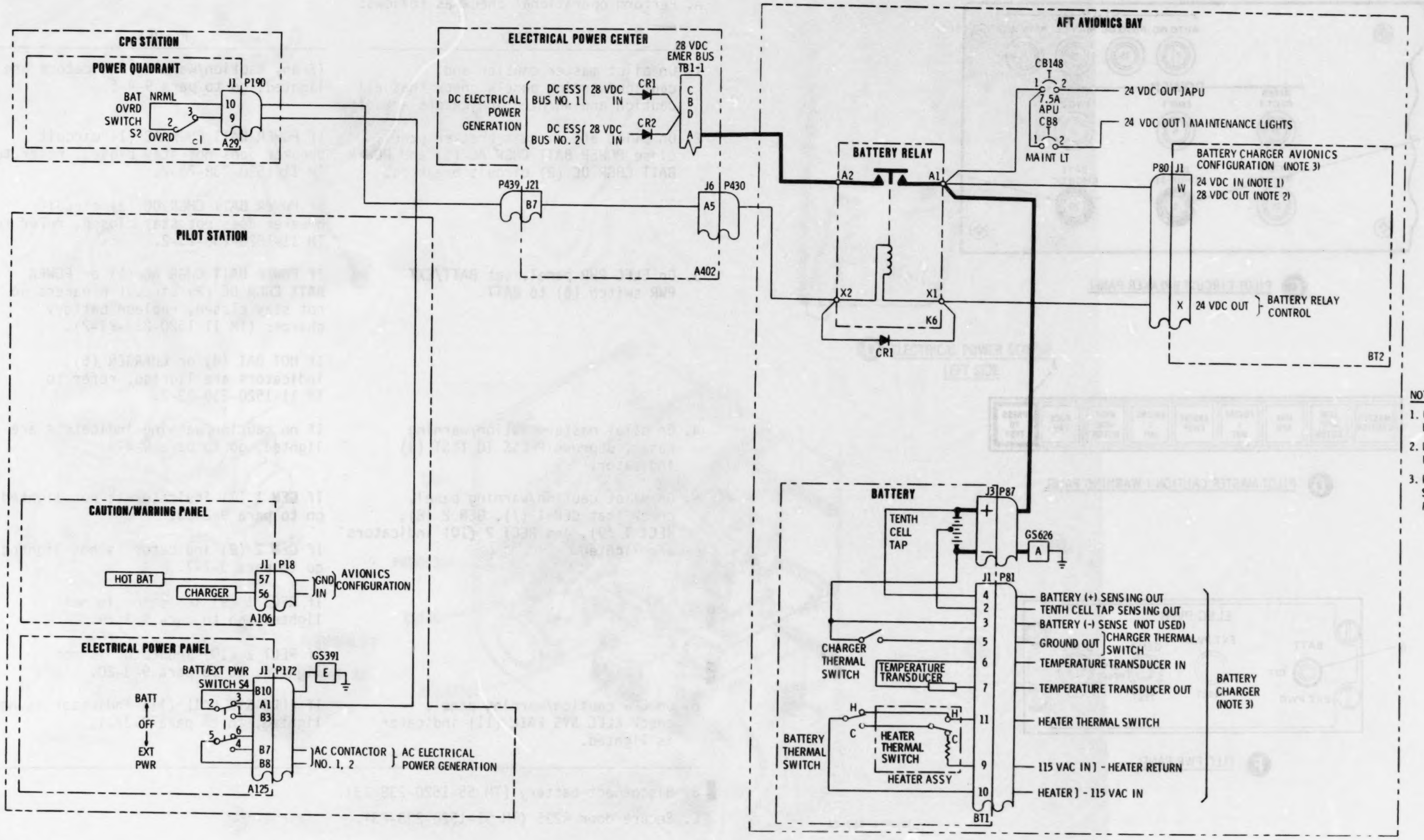
TASK	RESULT
1. On pilot master caution and caution/warning panels check that all caution and warning indicators are off.	If any caution/warning indicators are lighted, go to para 9-4-5.
2. On pilot aft circuit breaker panel, close **POWER BATT CHGR AC** (1) and **POWER BATT CHGR DC** (2) circuit breakers.	If **POWER BATT CHGR AC** (1) circuit breaker does not stay closed, refer to TM 11-1520-238-23-2. If **POWER BATT CHGR DC** (2) circuit breaker does not stay closed, refer to TM 11-1520-238-23-2.
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (6) to **BATT**.	If **POWER BATT CHGR AC** (1) or **POWER BATT CHGR DC** (2) circuit breakers do not stay closed, replace battery charger (TM 11-1520-238-23-2). If **HOT BAT** (4) or **CHARGER** (5) indicators are lighted, refer to TM 11-1520-238-23-2.
4. On pilot master caution/warning panel, depress **PRESS TO TEST** (3) indicator.	If no caution/warning indicators are lighted, go to para 9-4-4.
5. On pilot caution/warning panel, check that **GEN 1** (7), **GEN 2** (8), **RECT 1** (9), and **RECT 2** (10) indicators are lighted.	If **GEN 1** (7) indicator is not lighted, go to para 9-2-10. If **GEN 2** (8) indicator is not lighted, go to para 9-2-7. If **RECT 1** (9) indicator is not lighted, go to para 9-3-19. If **RECT 2** (10) indicator is not lighted, go to para 9-3-20.
6. On CPG caution/warning panel, check **ELEC SYS FAIL** (11) indicator is lighted.	If **ELEC SYS FAIL** (11) indicator is not lighted, go to para 9-32-1.

B. Disconnect battery (TM 55-1520-238-23).

C. Secure door R295 (TM 55-1520-238-23).

END OF TASK

9-4-2. BATTERY - INTERCONNECTION DIAGRAM

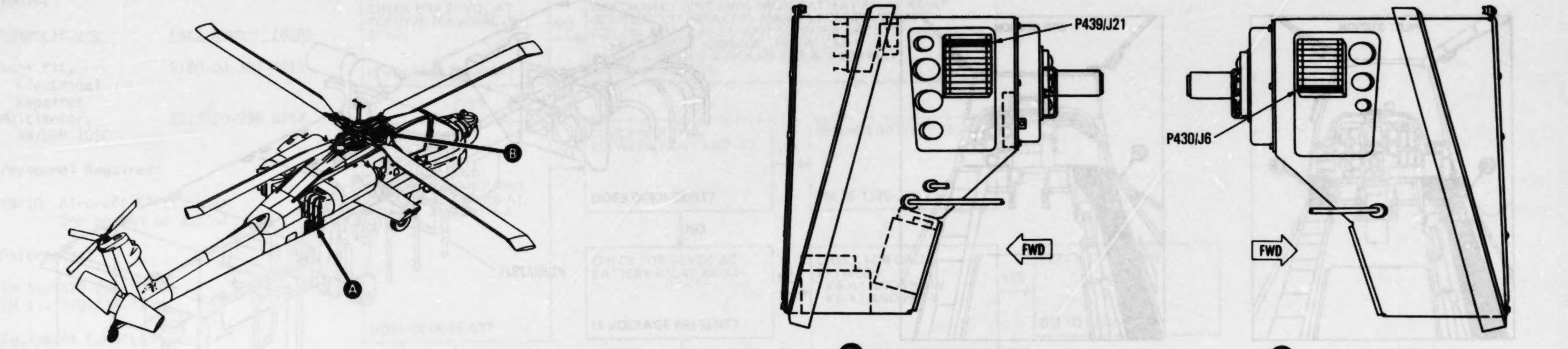

CPG STATION
POWER QUADRANT
BAT OVRD SWITCH S2
NRML
OVRD
J1 P190
10
9
A29
ELECTRICAL POWER CENTER
DC ELECTRICAL POWER GENERATION
DC ESS BUS NO. 1
28 VDC IN
DC ESS BUS NO. 2
28 VDC IN
CR1
CR2
28 VDC EMER BUS TB1-1
C
B
D
A
P439 J21
B7
J6 P430
A5
A402
PILOT STATION
CAUTION/WARNING PANEL
HOT BAT
CHARGER
J1 P18
57
56
GND
IN
AVIONICS CONFIGURATION
A106
ELECTRICAL POWER PANEL
BATT/EXT PWR SWITCH S4
J1 P172
GS391
E
B10
A1
B3
B7
B8
BATT
OFF
EXT PWR
AC CONTACTOR NO. 1, 2
AC ELECTRICAL POWER GENERATION
A125
AFT AVIONICS BAY
CB148
7.5A APU CB8
24 VDC OUT APU
24 VDC OUT MAINTENANCE LIGHTS
MAINT LT
BATTERY RELAY
A2
A1
X2
X1
K6
CR1
P80 J1
W
X
BATTERY CHARGER AVIONICS CONFIGURATION (NOTE 3)
24 VDC IN (NOTE 1)
28 VDC OUT (NOTE 2)
24 VDC OUT
BATTERY RELAY CONTROL
BT2
BATTERY
TENTH CELL TAP
J3 P87
GS626
A
J1 P81
4
2
3
5
6
7
11
9
10
BATTERY (+) SENSING OUT
TENTH CELL TAP SENSING OUT
BATTERY (-) SENSE (NOT USED)
GROUND OUT
CHARGER THERMAL SWITCH
TEMPERATURE TRANSDUCER IN
TEMPERATURE TRANSDUCER OUT
HEATER THERMAL SWITCH
115 VAC IN - HEATER RETURN
HEATER - 115 VAC IN
BATTERY CHARGER (NOTE 3)
CHARGER THERMAL SWITCH
TEMPERATURE TRANSDUCER
BATTERY THERMAL SWITCH
HEATER THERMAL SWITCH
HEATER ASSY
H
C
BT1

NOTES:

1. USING BATTERY FOR EMERGENCY POWER
2. DURING OPERATION OF POWER PLANTS
3. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL

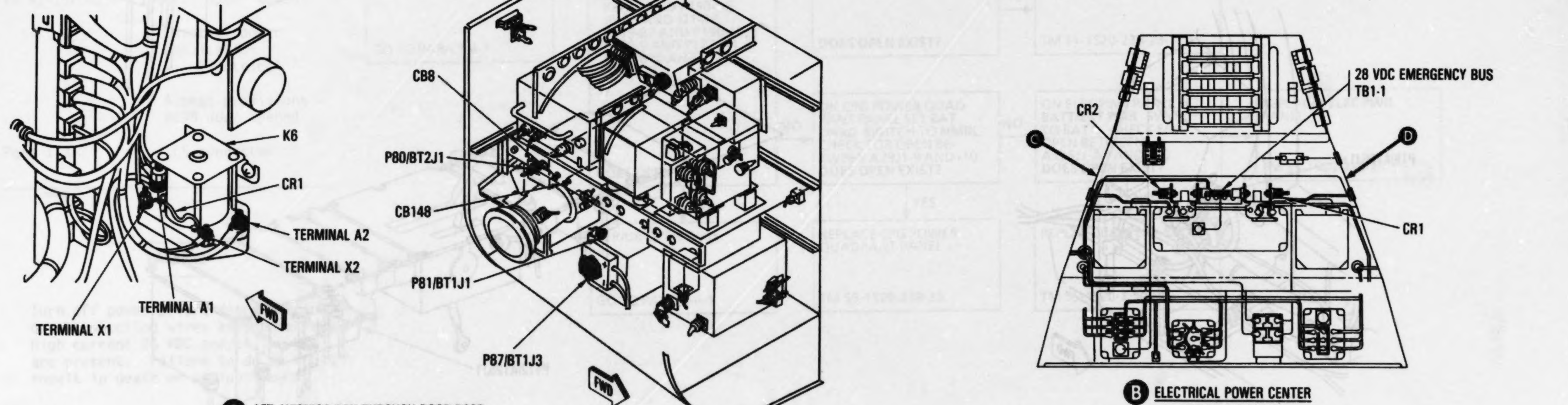
MM04/1-736B

9-4-3. BATTERY - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


B
A
P439/J21
FWD
P430/J6
FWD

D ELECTRICAL POWER CENTER LEFT SIDE

C ELECTRICAL POWER CENTER RIGHT SIDE

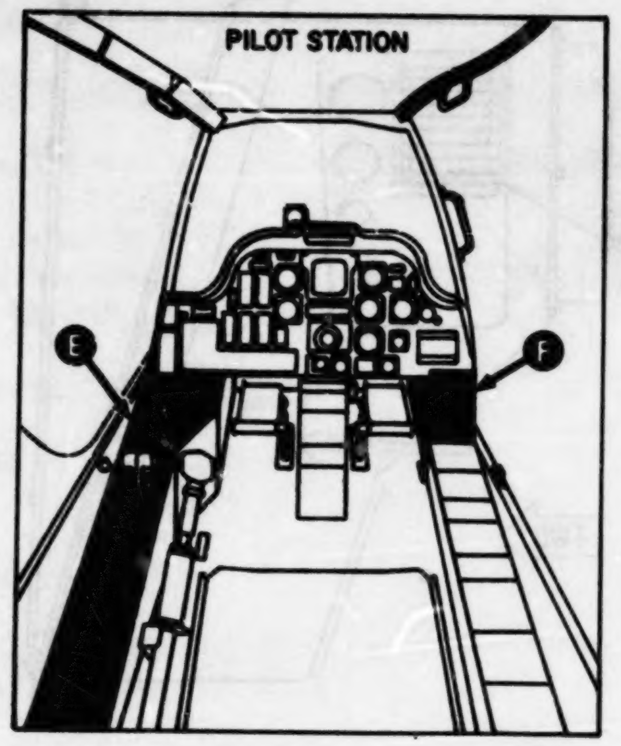

K6
CR1
TERMINAL A2
TERMINAL X2
TERMINAL A1
TERMINAL X1
FWD
CB8
P80/BT2J1
CB148
P81/BT1J1
P87/BT1J3
FWD
28 VDC EMERGENCY BUS
TB1-1
CR2
C
D
CR1

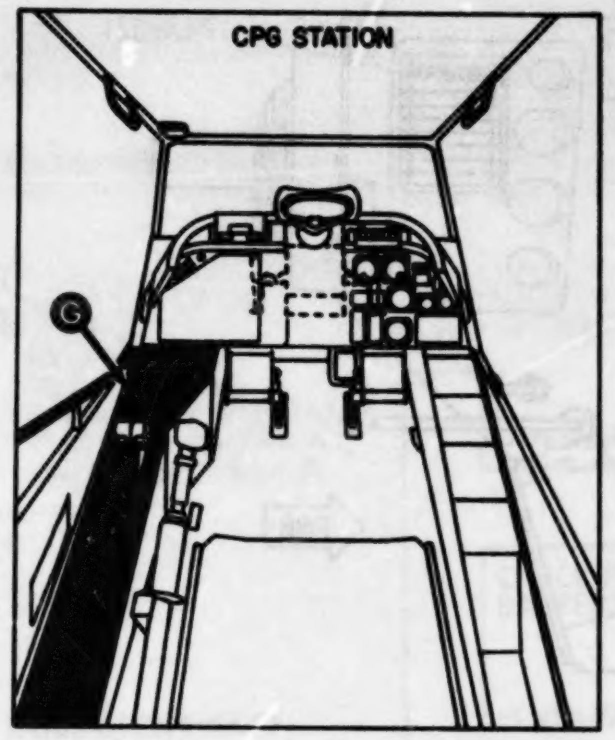
A AFT AVIONICS BAY THROUGH DOOR R295

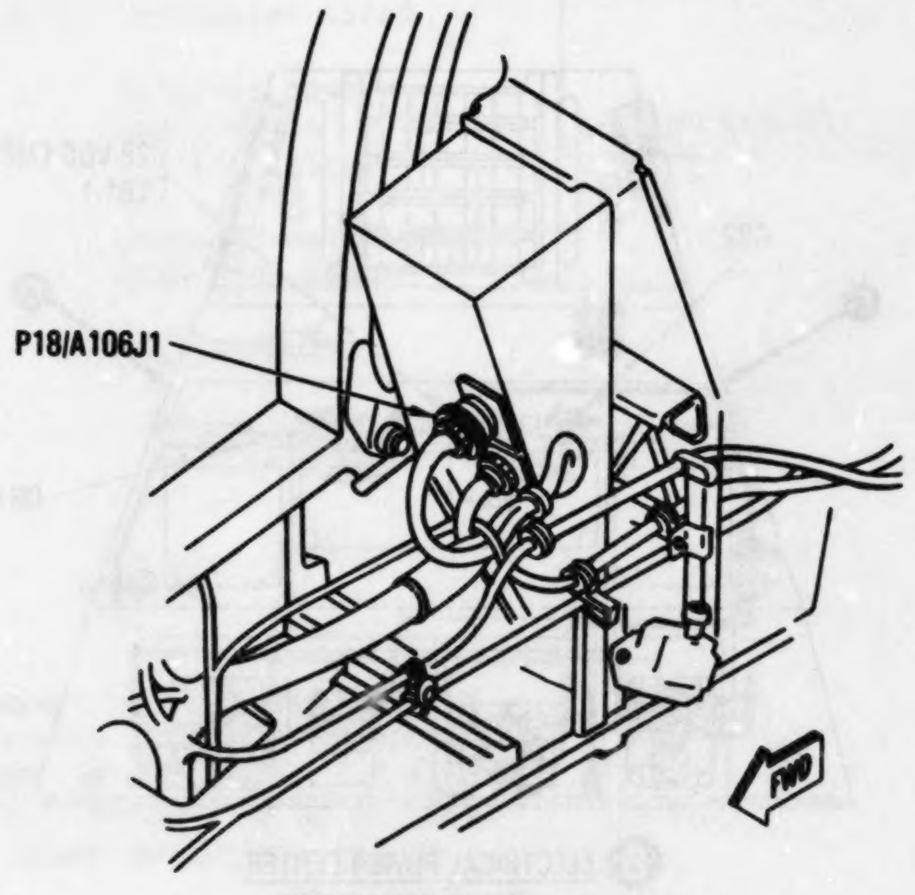
B ELECTRICAL POWER CENTER (COVER REMOVED)

MM04/1-1294-1A

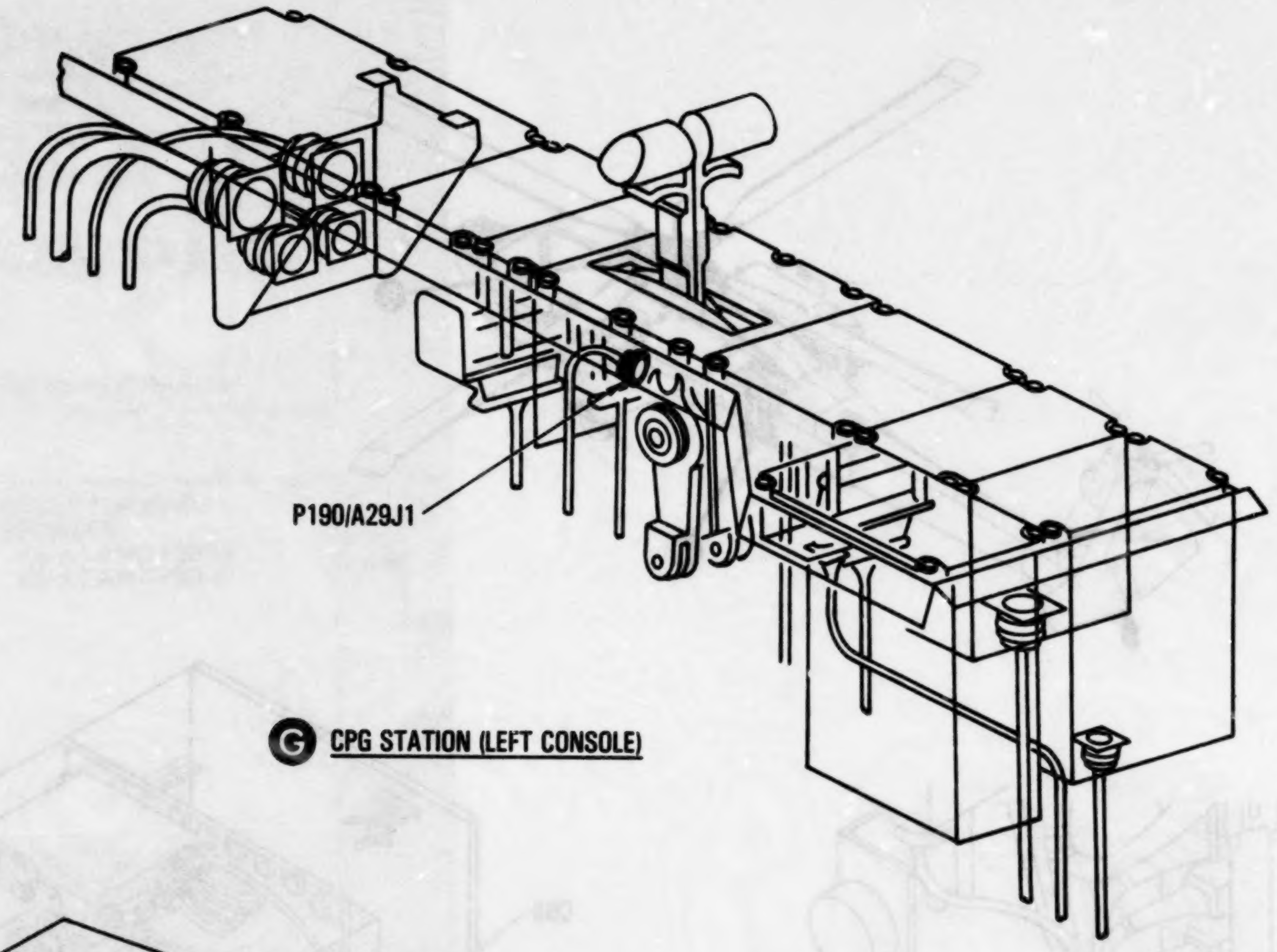
9-4-3. BATTERY - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


PILOT STATION
E
F

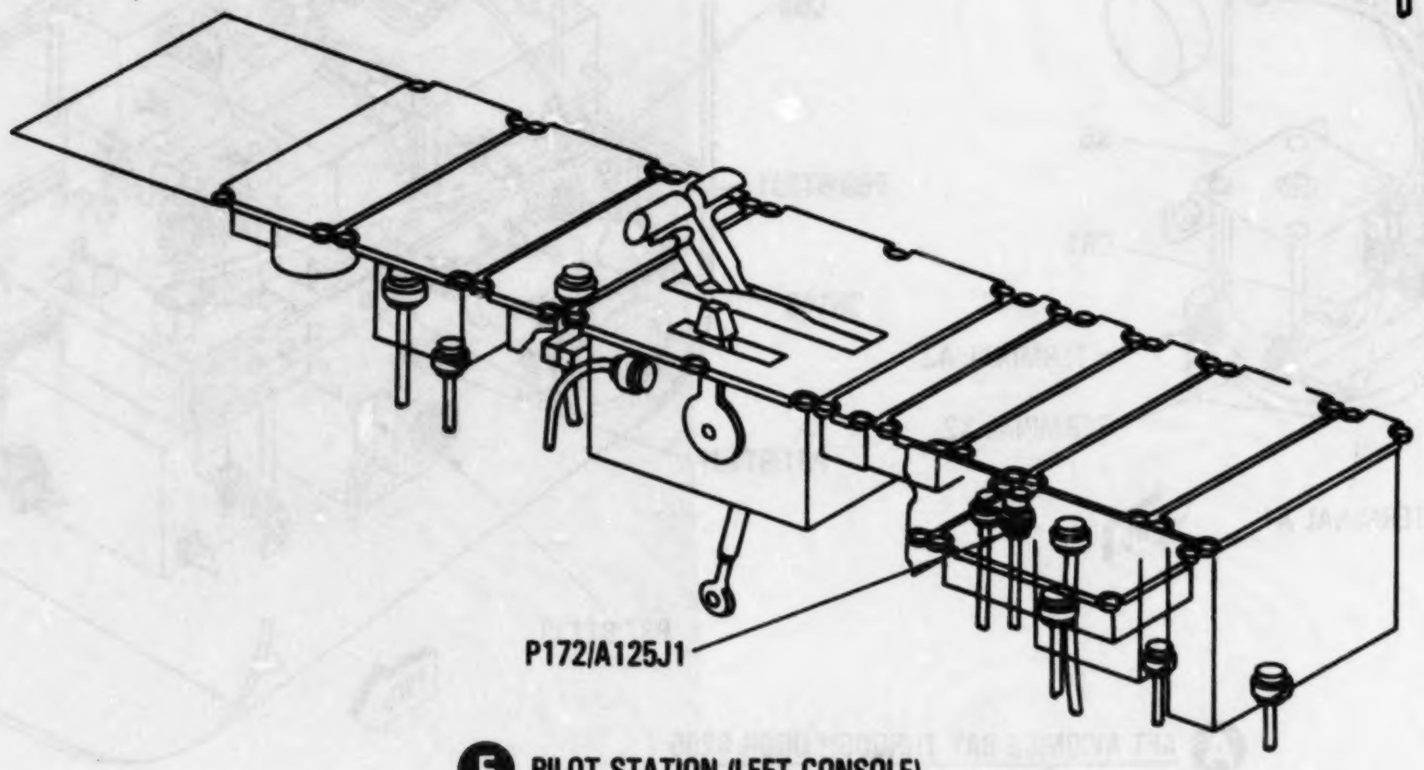

CPG STATION
G


P18/A106J1
FWD

F PILOT CAUTION/WARNING PANEL



G CPG STATION (LEFT CONSOLE)


P172/A125J1

E PILOT STATION (LEFT CONSOLE)

MM04/1-1294-2A

9-4-4. BATTERY - DOES NOT COME ON LINE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

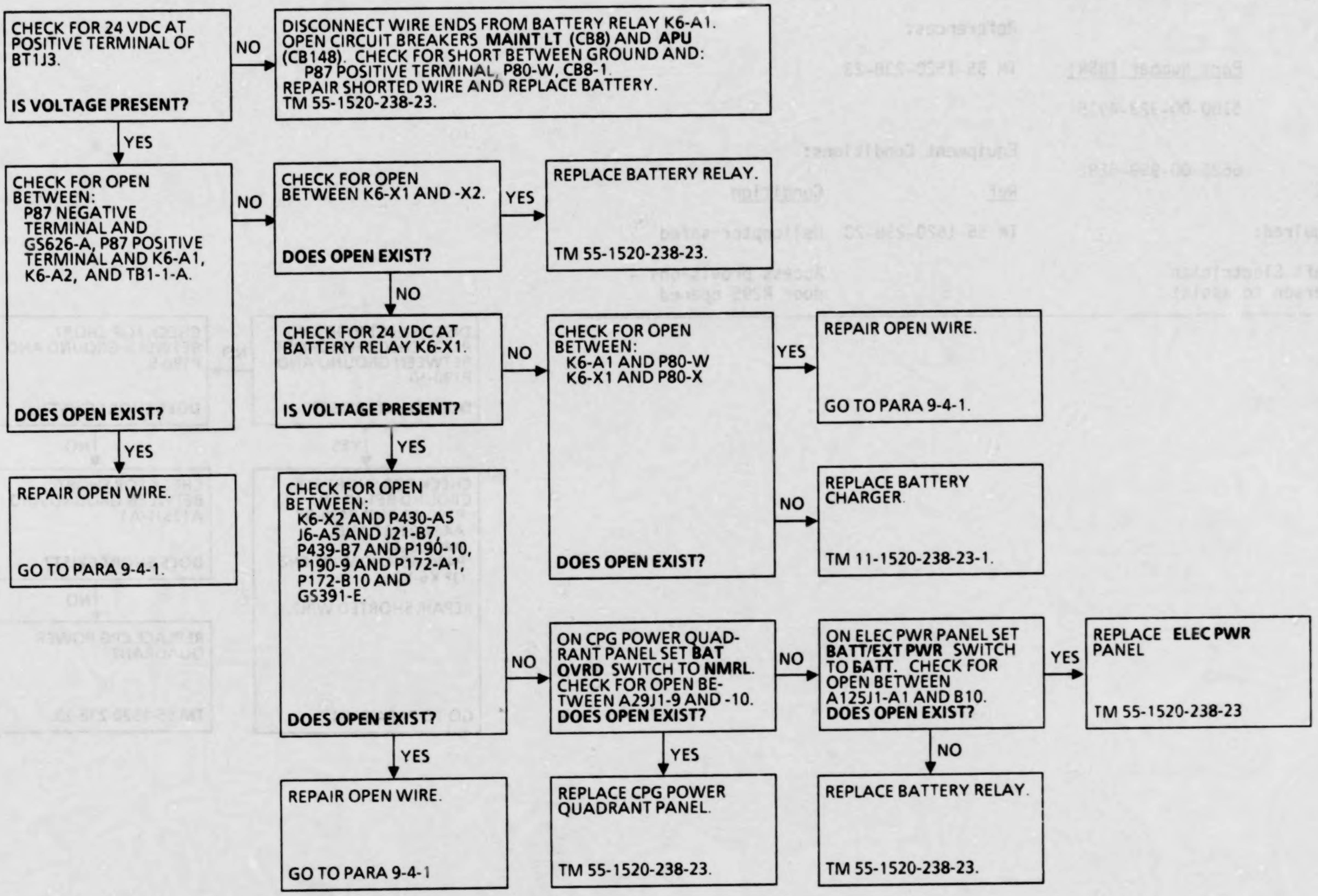
TM 55-1520-238-23
TM 11-1520-238-23-1

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Access provisions - R295 door opened
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 24 VDC AT POSITIVE TERMINAL OF BT1J3. IS VOLTAGE PRESENT?
NO
DISCONNECT WIRE ENDS FROM BATTERY RELAY K6-A1. OPEN CIRCUIT BREAKERS MAINT LT (CB8) AND APU (CB148). CHECK FOR SHORT BETWEEN GROUND AND: P87 POSITIVE TERMINAL, P80-W, CB8-1. REPAIR SHORTED WIRE AND REPLACE BATTERY. TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN: P87 NEGATIVE TERMINAL AND GS626-A, P87 POSITIVE TERMINAL AND K6-A1, K6-A2, AND TB1-1-A. DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN K6-X1 AND -X2. DOES OPEN EXIST?
YES
REPLACE BATTERY RELAY. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-4-1.
NO
CHECK FOR 24 VDC AT BATTERY RELAY K6-X1. IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN: K6-A1 AND P80-W K6-X1 AND P80-X DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-4-1.
NO
REPLACE BATTERY CHARGER. TM 11-1520-238-23-1.
YES
CHECK FOR OPEN BETWEEN: K6-X2 AND P430-A5 J6-A5 AND J21-B7, P439-B7 AND P190-10, P190-9 AND P172-A1, P172-B10 AND GS391-E. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-4-1
NO
ON CPG POWER QUADRANT PANEL SET BAT OVRD SWITCH TO NMRL. CHECK FOR OPEN BETWEEN A29J1-9 AND -10. DOES OPEN EXIST?
YES
REPLACE CPG POWER QUADRANT PANEL. TM 55-1520-238-23.
NO
ON ELEC PWR PANEL SET BATT/EXT PWR SWITCH TO BATT. CHECK FOR OPEN BETWEEN A125J1-A1 AND B10. DOES OPEN EXIST?
YES
REPLACE ELEC PWR PANEL TM 55-1520-238-23
NO
REPLACE BATTERY RELAY. TM 55-1520-238-23.

END OF TASK

9-4-5. CAUTION/WARNING INDICATORS - ARE ILLUMINATED WITH POWER OFF AND BATTERY CONNECTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

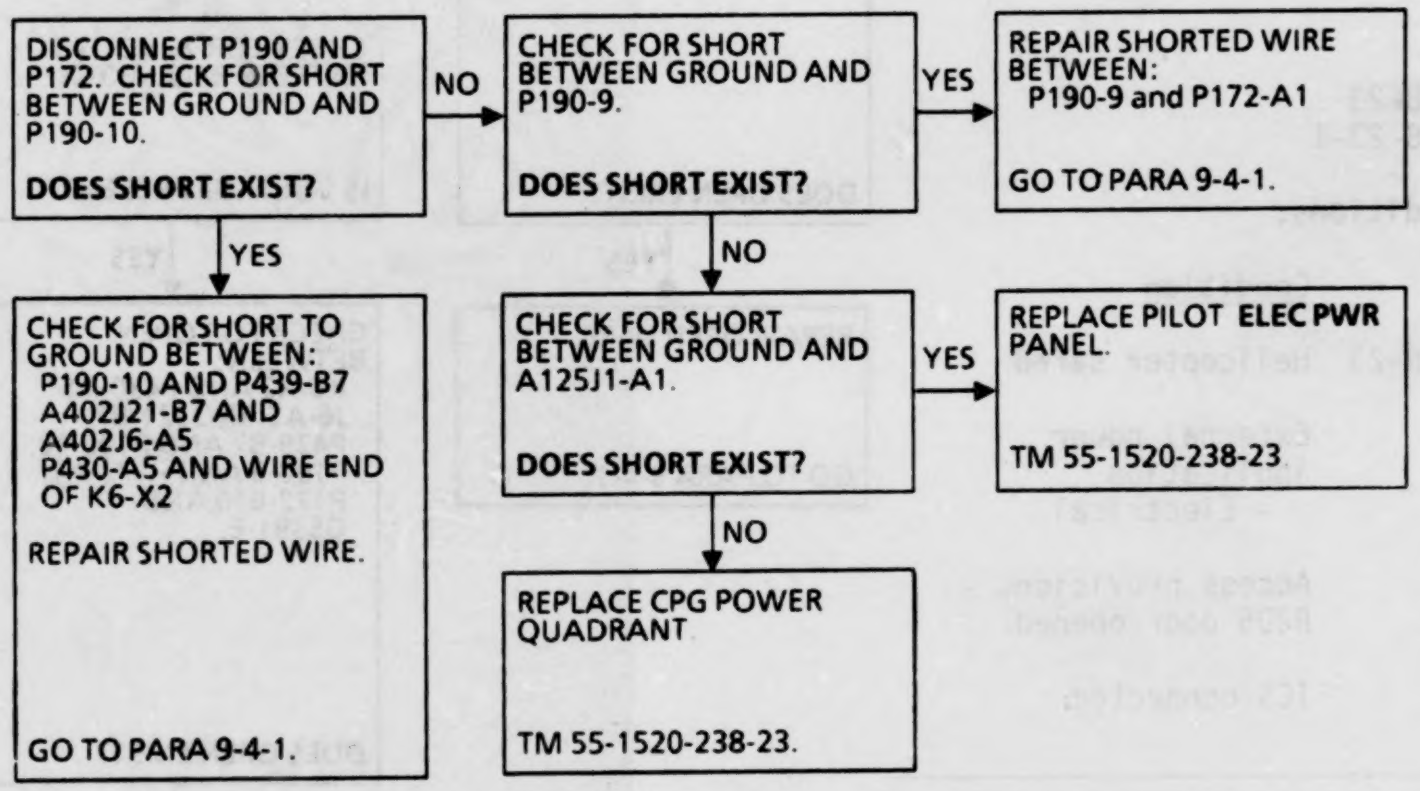
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - door R295 opened


DISCONNECT P190 AND P172. CHECK FOR SHORT BETWEEN GROUND AND P190-10.
DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN GROUND AND P190-9.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: P190-9 and P172-A1
GO TO PARA 9-4-1.
YES
CHECK FOR SHORT TO GROUND BETWEEN: P190-10 AND P439-B7 A402J21-B7 AND A402J6-A5 P430-A5 AND WIRE END OF K6-X2
REPAIR SHORTED WIRE.
GO TO PARA 9-4-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND A125J1-A1.
DOES SHORT EXIST?
YES
REPLACE PILOT ELEC PWR PANEL.
TM 55-1520-238-23
NO
REPLACE CPG POWER QUADRANT
TM 55-1520-238-23.

END OF TASK

9-5-1. EXTERNAL POWER AND GROUND SERVICE UTILITY RECEPTACLE - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

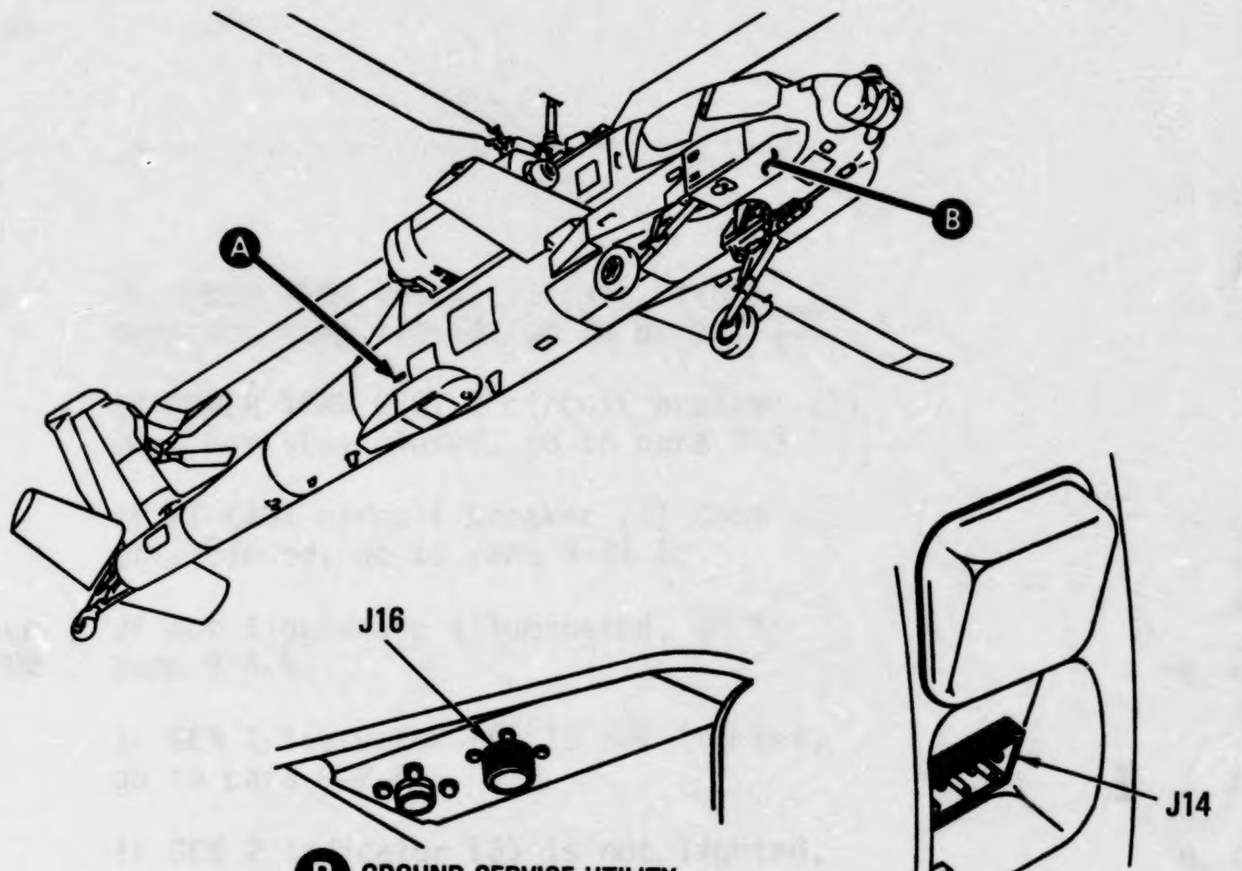
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
	Access provisions - Doors B60R and R345 open

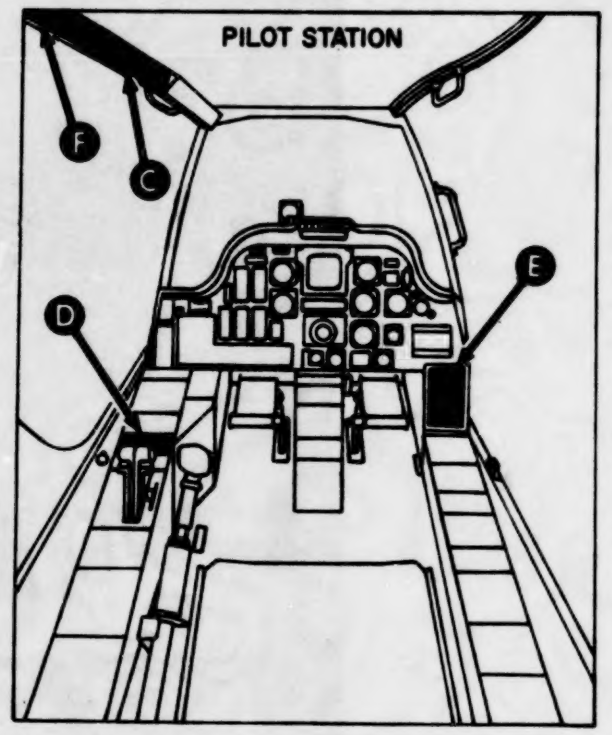
WARNING

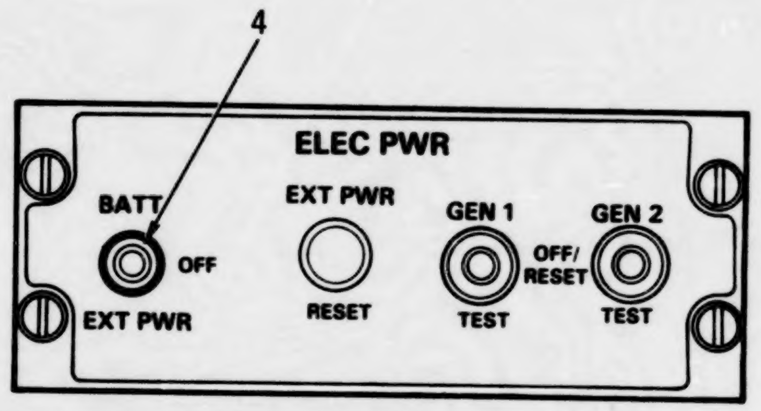
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



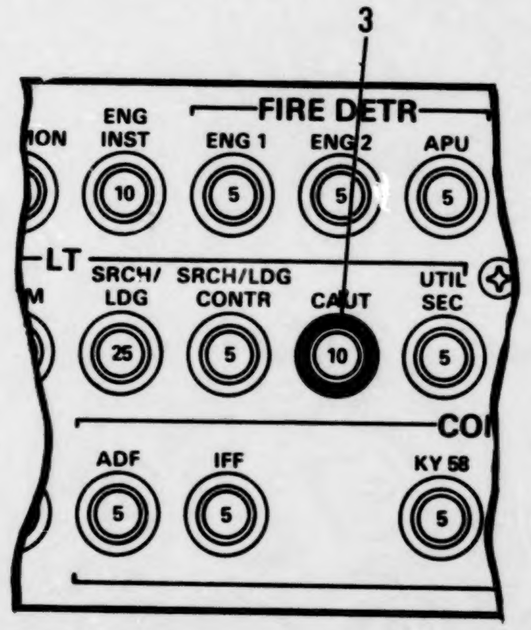
Ⓑ GROUND SERVICE UTILITY RECEPTACLE THROUGH DOOR B60R

Ⓐ EXTERNAL POWER RECEPTACLE THROUGH DOOR R345

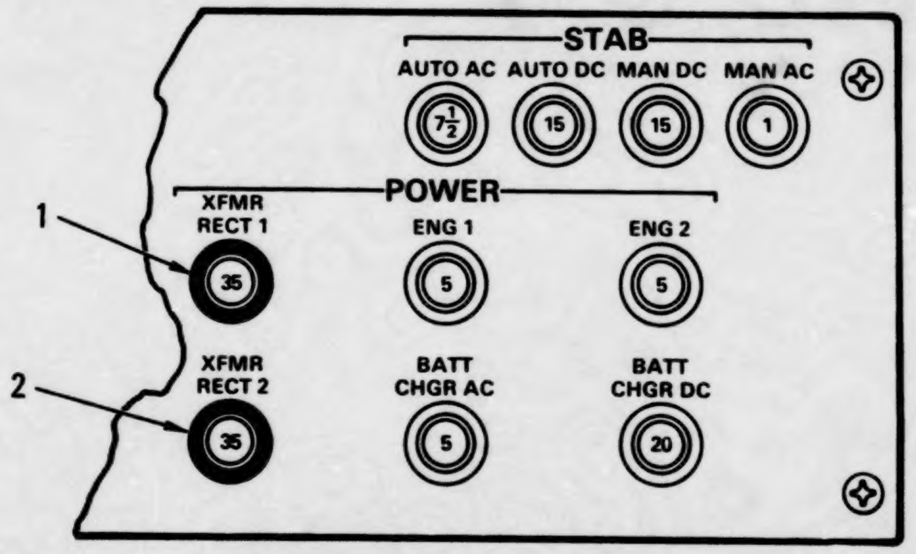

PILOT STATION
F
C
D
E


4
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
TEST
OFF/
RESET
GEN 2
TEST

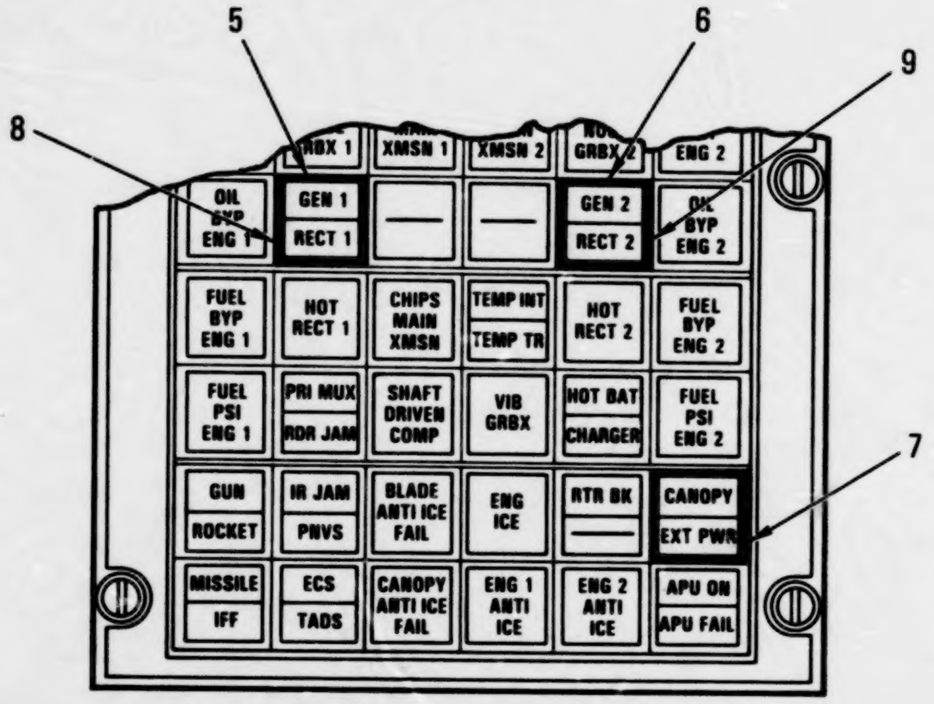
Ⓓ EXT PWR PANEL


3
ION
ENG INST
FIRE DETR
ENG 1
ENG 2
APU
10
5
5
5
LT
M
SRCH/LDG
SRCH/LDG CONTR
CAUT
UTIL SEC
25
5
10
5
CO
ADF
IFF
KY 58
5
5
5

PILOT CENTER CIRCUIT BREAKER PANEL


STAB
AUTO AC
AUTO DC
MAN DC
MAN AC
7½
15
15
1
1
XFMR RECT 1
POWER
ENG 1
ENG 2
35
5
5
2
XFMR RECT 2
BATT CHGR AC
BATT CHGR DC
35
5
20

Ⓕ PILOT AFT CIRCUIT BREAKER PANEL


5
6
9
8
7
GRBX 1
XMSN 1
XMSN 2
GRBX 2
ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

Ⓔ PILOT CAUTION/WARNING PANEL

MM04/1-902C

GO TO NEXT PAGE

9-5-1. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (4) to EXT PWR position.	
2. On pilot circuit breaker panel, check that **POWER XFMR RECT 1** (1), **POWER XFMR RECT 2** (2), and **LT CAUT** (3) circuit breakers are closed.	If **POWER XFMR RECT 1** circuit breaker (1) does not stay closed, go to para 9-3-6. If **POWER XFMR RECT 2** circuit breaker (2) does not stay closed, go to para 9-3-7. If **LT CAUT** circuit breaker (3) does not stay closed, go to para 9-31-1.
3. On pilot caution/warning panel, check that **GEN 1** (5), **GEN 2** (6) and **EXT PWR** (7) indicator are lighted.	If not lights are illuminated, go to para 9-5-6. If **GEN 1** indicator (5) is not lighted, go to para 9-2-8. If **GEN 2 indicator** (6) is not lighted, go to para 9-2-9. If **EXT PWR** indicator (7) is not lighted, go to para 9-5-10.
4. On pilot caution/warning panel, check that **RECT 1** (8) and **RECT 2** (9) indicators are not lighted.	If **RECT 1** indicator (8) is lighted, go to para 9-3-8. If **RECT 2** indicator (9) is lighted, go to para 9-3-9. If both indicators are lighted, go to para 9-5-6.
5. On ground service receptacle, check for 115 VAC at J16-B, J16-F, and J16-E.	If 115 VAC is not present at J16-B, and J16-F, and J16-E, go to para 9-5-8.
6. On ground service receptacle, check for 28 VDC at J16-A.	If 28 VDC is not present at J16-A, go to para 9-5-9.
7. Perform power down, para 9-5-3.	
8. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (4) to **BATT** position.	
9. On pilot caution/warning panel, check that **EXT PWR** indicator (7) is not lighted.	If **EXT PWR** indicator (7) is lighted, go to para 9-5-11.
10 On **ELEC PWR** panel, set **BATT/EXT PWR** switch (4) to OFF.	

END OF TASK

9-5-2. EXTERNAL POWER - POWER UP

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

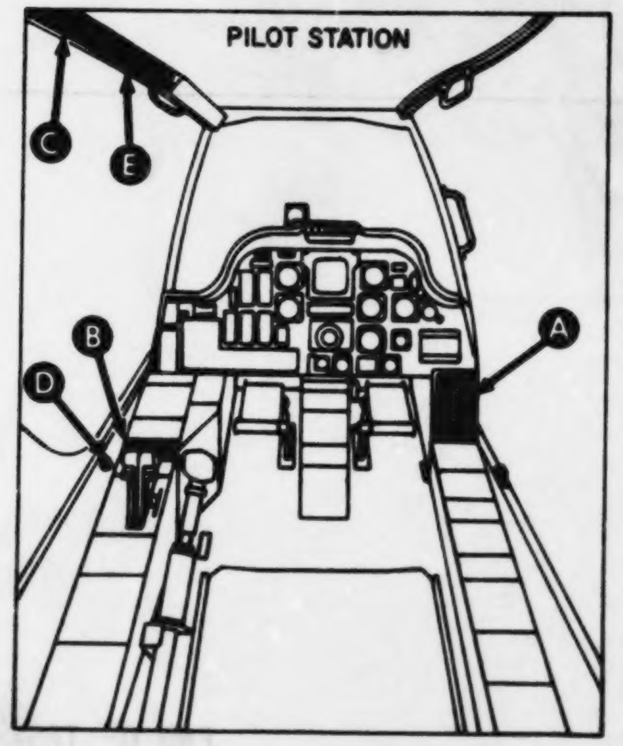
68F10 Aircraft Electrician

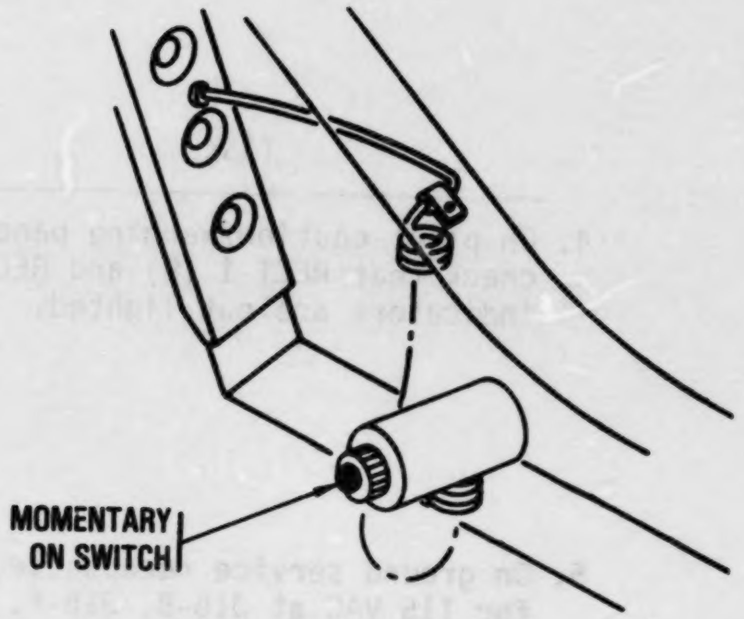
References:

TM 55-1520-238-23

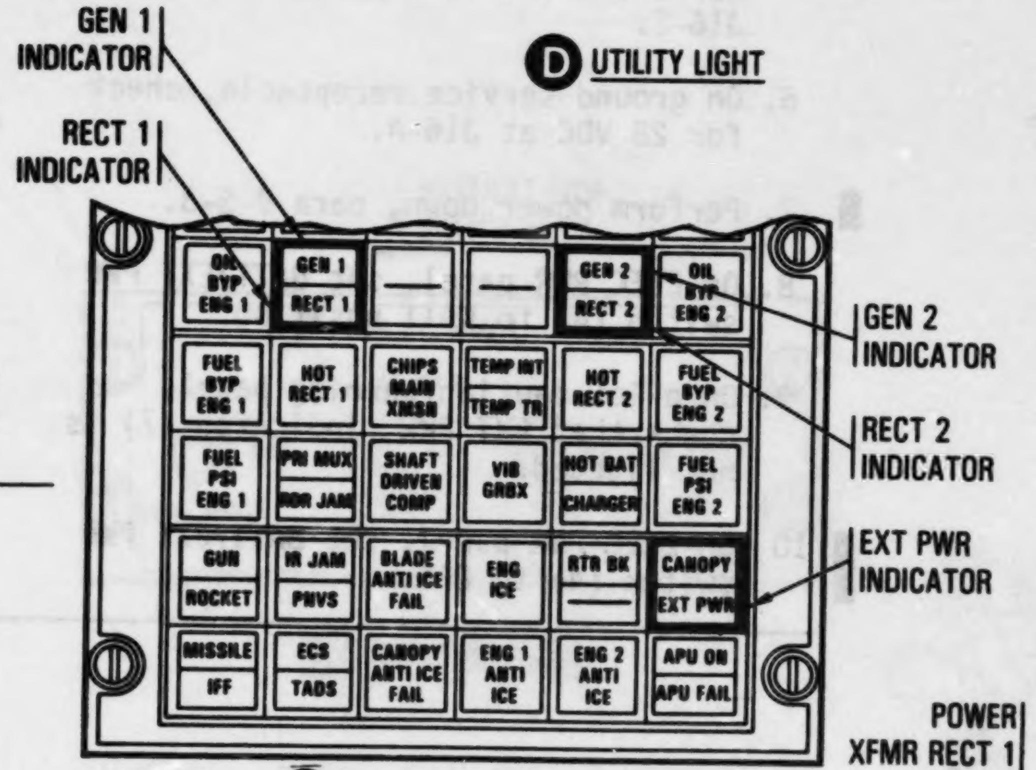
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

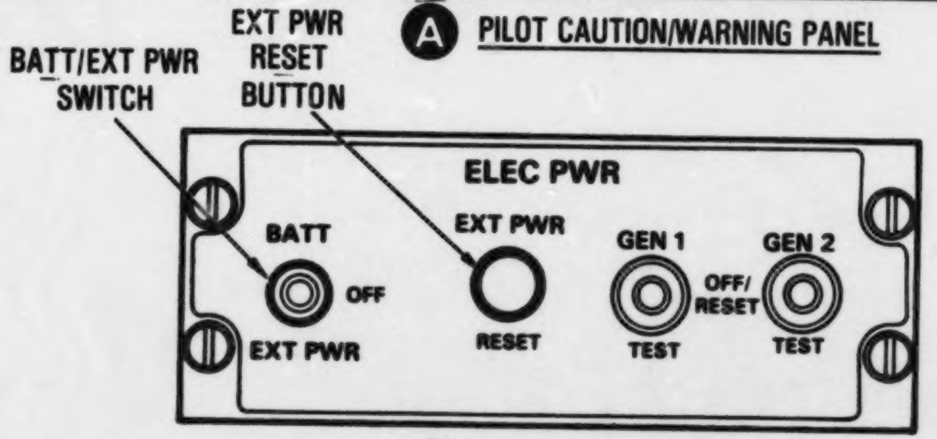

PILOT STATION
C
E
A
B
D


MOMENTARY ON SWITCH

D UTILITY LIGHT


GEN 1 INDICATOR
RECT 1 INDICATOR
GEN 2 INDICATOR
RECT 2 INDICATOR
EXT PWR INDICATOR
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

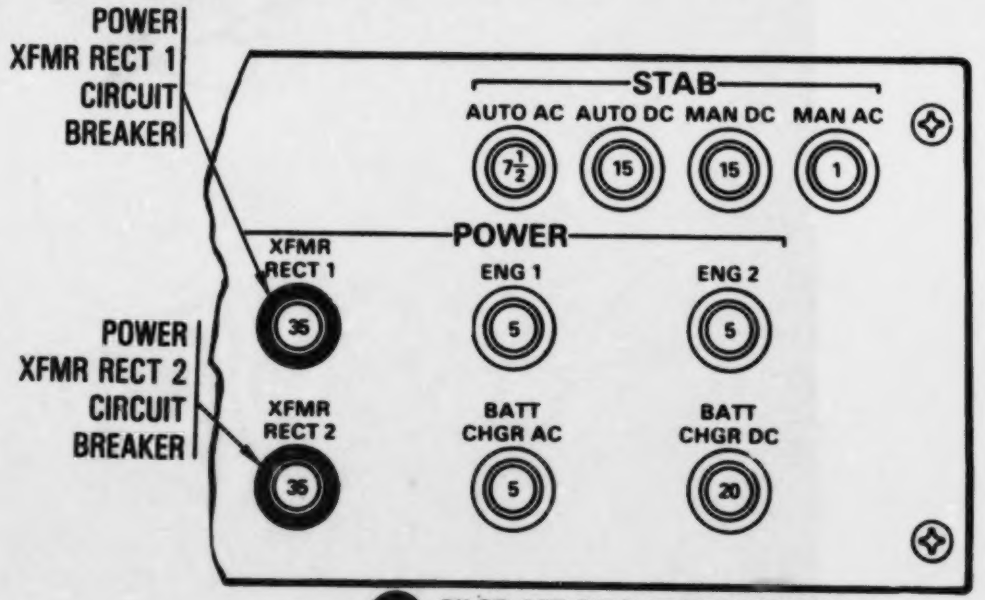
A PILOT CAUTION/WARNING PANEL


BATT/EXT PWR SWITCH
EXT PWR RESET BUTTON
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
TEST
GEN 2
OFF/ RESET
TEST

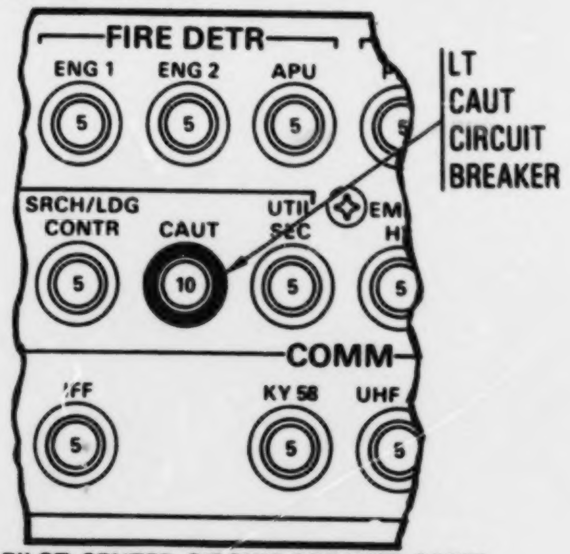
B ELEC PWR PANEL

A. Perform power up as follows:

TASK	RESULT
1. On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR.	If power does not come on, depress the EXT PWR RESET switch. If power still does not come on, go to para 9-5-12.
2. On pilot circuit breaker panel, check that POWER XFMR RECT 1, POWER XFMR RECT 2, and LT CAUT circuit breakers are closed.	If POWER XFMR RECT 1 circuit breaker does not stay closed, go to para 9-3-6. If POWER XFMR RECT 2 circuit breaker does not stay closed, go to para 9-3-7. If LT CAUT circuit breaker does not stay closed, go to para 9-31-1.
3. On utility light press momentary on switch. Check that utility light and caution/warning lights are lighted.	If utility light and caution/warning lights are not lighted, go to para 9-3-1.
4. On pilot caution/warning panel, check that GEN 1, GEN 2, and EXT PWR indicators are lighted.	If GEN 1 indicator is not lighted, go to para 9-2-8. If GEN 2 indicator is not lighted, go to para 9-2-9. If EXT PWR indicator is not lighted, go to para 9-5-10.
5. On pilot caution/warning panel, check that RECT 1 and RECT 2 indicators are not lighted.	If RECT 1 indicator is lighted, go to para 9-3-8. If RECT 2 indicator is lighted, go to para 9-3-9.


POWER XFMR RECT 1 CIRCUIT BREAKER
POWER XFMR RECT 2 CIRCUIT BREAKER
STAB
AUTO AC
AUTO DC
MAN DC
MAN AC
7½
15
15
1
POWER
XFMR RECT 1
35
ENG 1
5
ENG 2
5
XFMR RECT 2
35
BATT CHGR AC
5
BATT CHGR DC
20

C PILOT AFT CIRCUIT BREAKER PANEL


FIRE DETR
ENG 1
ENG 2
APU
5
5
5
5
LT CAUT CIRCUIT BREAKER
SRCH/LDG CONTR
CAUT
UTIL SEC
5
10
5
5
COMM
KY 58
UHF
5
5
5

E PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-903B

END OF TASK

9-5-3. EXTERNAL POWER - POWER DOWN

Personnel Required: (para 9-5-2)

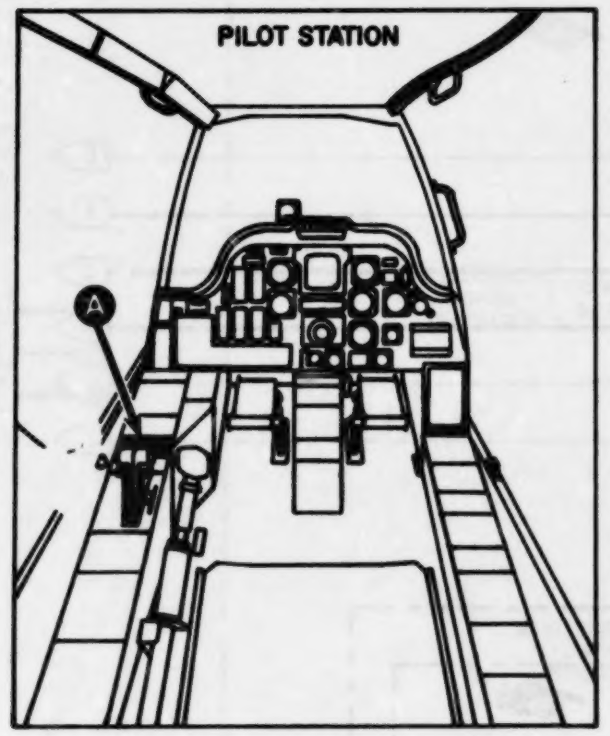
References: (para 9-5-2)

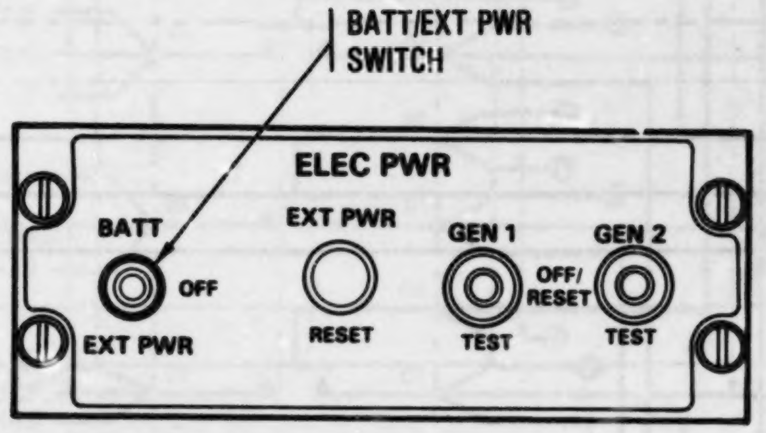
Equipment Conditions: (para 9-5-2)

A. On ELEC PWR panel, set BATT/EXT PWR switch to OFF.

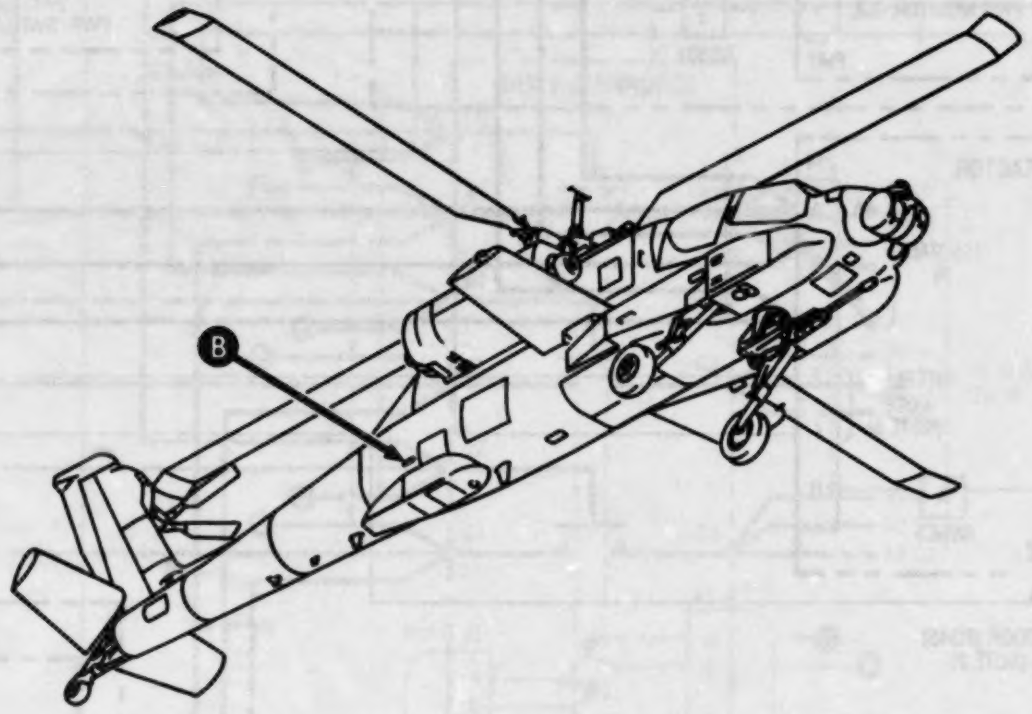
B. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

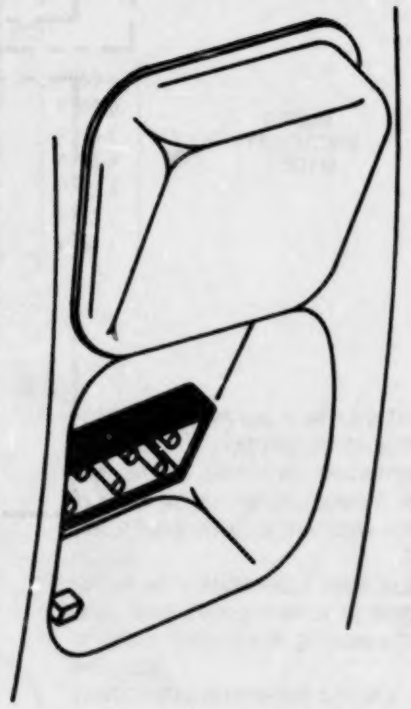
C. Secure doors R345 and B60R (TM 55-1520-238-23).


PILOT STATION
A


BATT/EXT PWR SWITCH
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
TEST
OFF/ RESET
GEN 2
TEST

Ⓐ ELEC PWR PANEL



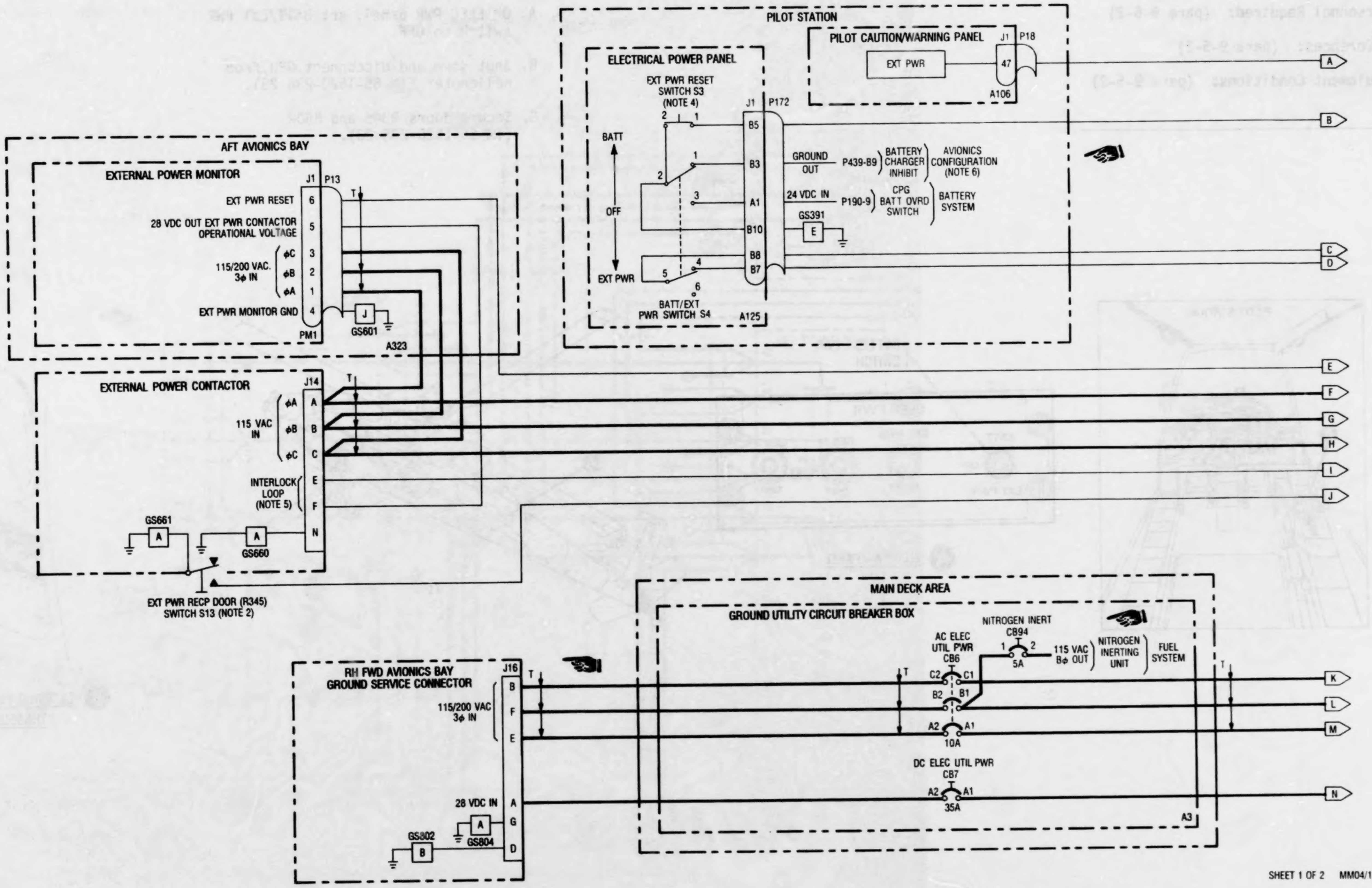


Ⓑ EXTERNAL POWER RECEPTACLE THROUGH DOOR R345

MM04/1-904A

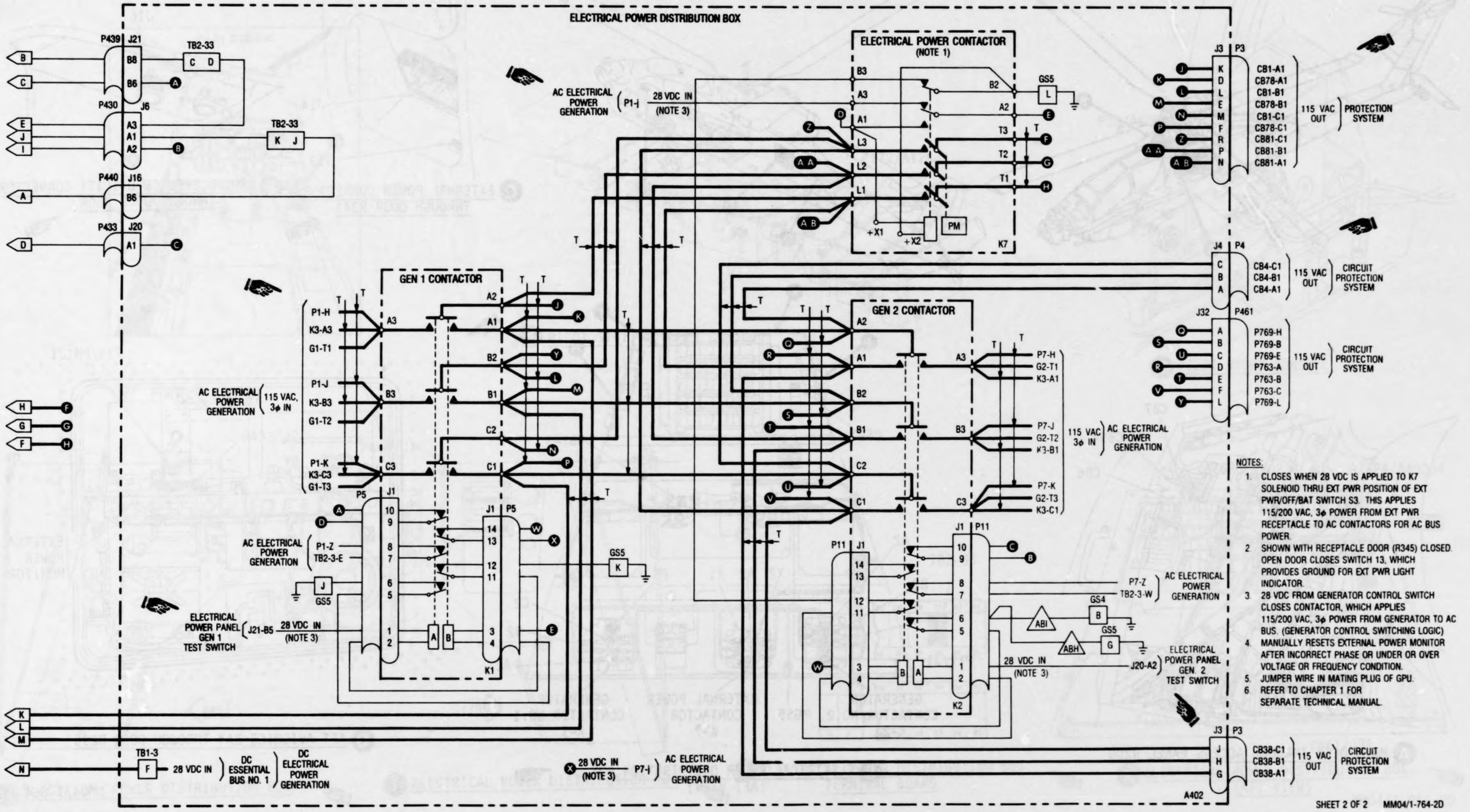
END OF TASK

9-5-4. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR - INTERCONNECTION DIAGRAM (cont)


PILOT STATION
PILOT CAUTION/WARNING PANEL
EXT PWR
J1
P18
47
A106
ELECTRICAL POWER PANEL
EXT PWR RESET
SWITCH S3
(NOTE 4)
2
1
J1
P172
BATT
OFF
EXT PWR
B5
B3
A1
B10
B8
B7
3
4
5
6
BATT/EXT
PWR SWITCH S4
A125
GROUND
OUT
P439-B9
BATTERY
CHARGER
INHIBIT
AVIONICS
CONFIGURATION
(NOTE 6)
24 VDC IN
P190-9
CPG
BATT OVRD
SWITCH
BATTERY
SYSTEM
GS391
E
AFT AVIONICS BAY
EXTERNAL POWER MONITOR
J1
P13
T
EXT PWR RESET
6
28 VDC OUT EXT PWR CONTACTOR
OPERATIONAL VOLTAGE
5
115/200 VAC.
3ϕ IN
ϕC
3
ϕB
2
ϕA
1
EXT PWR MONITOR GND
4
PM1
J
GS601
A323
EXTERNAL POWER CONTACTOR
J14
T
115 VAC
IN
ϕA
A
ϕB
B
ϕC
C
INTERLOCK
LOOP
(NOTE 5)
E
F
N
GS661
A
A
GS660
EXT PWR RECP DOOR (R345)
SWITCH S13 (NOTE 2)
A
B
C
D
E
F
G
H
I
J
K
L
M
N
RH FWD AVIONICS BAY
GROUND SERVICE CONNECTOR
J16
T
115/200 VAC
3ϕ IN
B
F
E
28 VDC IN
A
G
D
A
GS804
GS802
B
MAIN DECK AREA
GROUND UTILITY CIRCUIT BREAKER BOX
AC ELEC
UTIL PWR
CB6
C2
C1
B2
B1
A2
A1
10A
NITROGEN INERT
CB94
1
2
5A
115 VAC
Bϕ OUT
NITROGEN
INERTING
UNIT
FUEL
SYSTEM
DC ELEC UTIL PWR
CB7
A2
A1
35A
A3
T

SHEET 1 OF 2 MM04/1-764-1D

9-5-4. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR - INTERCONNECTION DIAGRAM (cont)

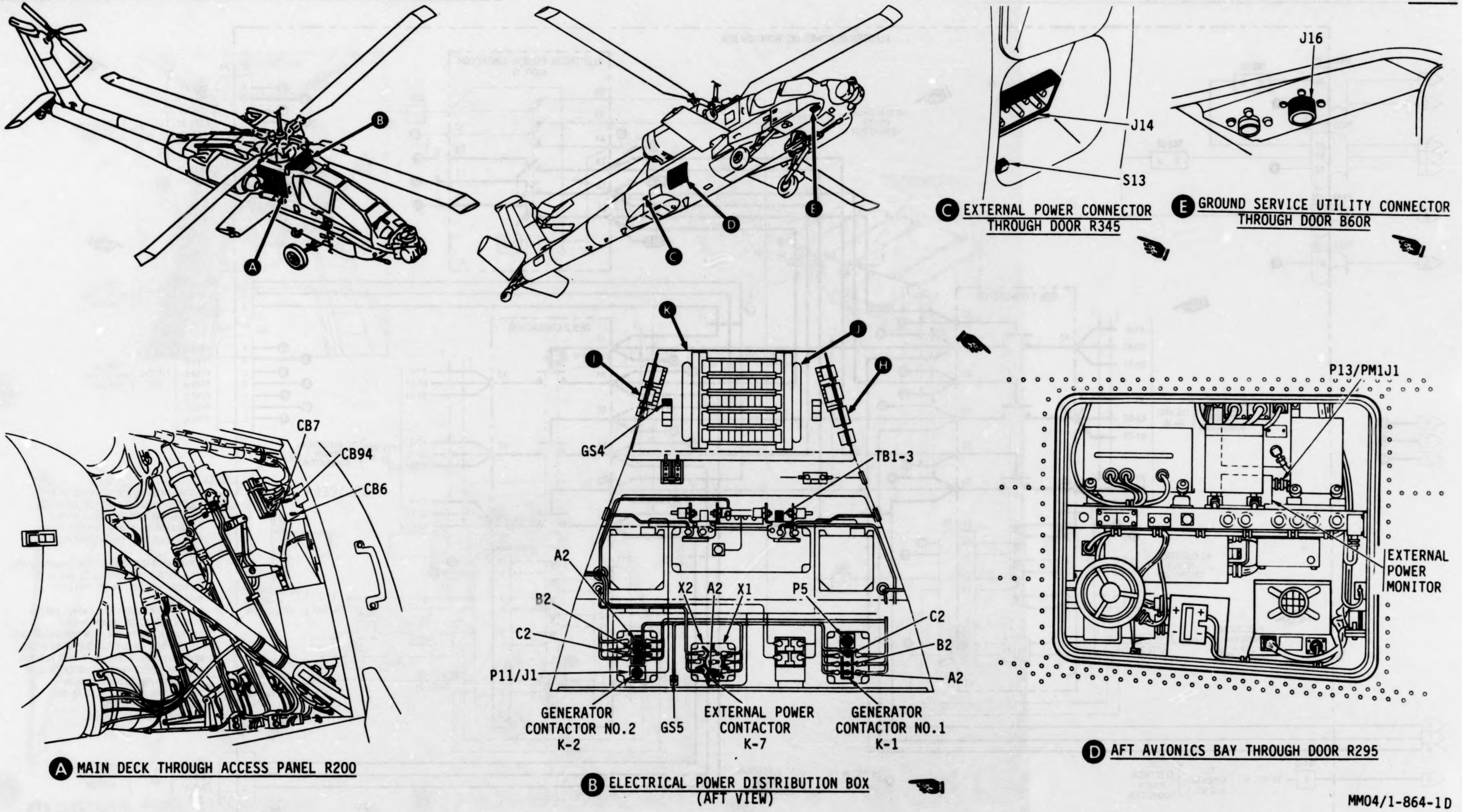

ELECTRICAL POWER DISTRIBUTION BOX
P439 J21
B8
B6
TB2-33
C D
P430 J6
A3
A1
A2
TB2-33
K J
P440 J16
B6
P433 J20
A1
ELECTRICAL POWER CONTACTOR (NOTE 1)
B3
A3
A1
L3
L2
L1
B2
A2
T3
T2
T1
GS5
L
+X1
+X2
PM
K7
AC ELECTRICAL POWER GENERATION
P1-J
28 VDC IN (NOTE 3)
J3 P3
CB1-A1
CB78-A1
CB1-B1
CB78-B1
CB1-C1
CB78-C1
CB81-C1
CB81-B1
CB81-A1
115 VAC OUT
PROTECTION SYSTEM
J4 P4
CB4-C1
CB4-B1
CB4-A1
115 VAC OUT
CIRCUIT PROTECTION SYSTEM
J32 P461
P769-H
P769-B
P769-E
P763-A
P763-B
P763-C
P769-L
115 VAC OUT
CIRCUIT PROTECTION SYSTEM
GEN 1 CONTACTOR
P1-H
K3-A3
G1-T1
P1-J
K3-B3
G1-T2
P1-K
K3-C3
G1-T3
AC ELECTRICAL POWER GENERATION
115 VAC, 3ϕ IN
A3
B3
C3
A2
A1
B2
B1
C2
C1
P5 J1
J1 P5
K1
AC ELECTRICAL POWER GENERATION
P1-Z
TB2-3-E
GS5
J
K
ELECTRICAL POWER PANEL GEN 1 TEST SWITCH
J21-B5
28 VDC IN (NOTE 3)
GEN 2 CONTACTOR
P7-H
G2-T1
K3-A1
P7-J
G2-T2
K3-B1
P7-K
G2-T3
K3-C1
115 VAC 3ϕ IN
AC ELECTRICAL POWER GENERATION
P11 J1
J1 P11
K2
P7-Z
TB2-3-W
AC ELECTRICAL POWER GENERATION
GS4
B
GS5
G
ABI
ABH
ELECTRICAL POWER PANEL GEN 2 TEST SWITCH
J20-A2
28 VDC IN (NOTE 3)
TB1-3
F
28 VDC IN
DC ESSENTIAL BUS NO. 1
DC ELECTRICAL POWER GENERATION
28 VDC IN (NOTE 3)
P7-J
AC ELECTRICAL POWER GENERATION
J3 P3
CB38-C1
CB38-B1
CB38-A1
115 VAC OUT
CIRCUIT PROTECTION SYSTEM
A402

NOTES:

1. CLOSES WHEN 28 VDC IS APPLIED TO K7 SOLENOID THRU EXT PWR POSITION OF EXT PWR/OFF/BAT SWITCH S3. THIS APPLIES 115/200 VAC, 3ϕ POWER FROM EXT PWR RECEPTACLE TO AC CONTACTORS FOR AC BUS POWER.
2. SHOWN WITH RECEPTACLE DOOR (R345) CLOSED. OPEN DOOR CLOSES SWITCH 13, WHICH PROVIDES GROUND FOR EXT PWR LIGHT INDICATOR.
3. 28 VDC FROM GENERATOR CONTROL SWITCH CLOSES CONTACTOR, WHICH APPLIES 115/200 VAC, 3ϕ POWER FROM GENERATOR TO AC BUS. (GENERATOR CONTROL SWITCHING LOGIC)
4. MANUALLY RESETS EXTERNAL POWER MONITOR AFTER INCORRECT PHASE OR UNDER OR OVER VOLTAGE OR FREQUENCY CONDITION.
5. JUMPER WIRE IN MATING PLUG OF GPU.
6. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

SHEET 2 OF 2 MM04/1-764-2D

9-5-5. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
B
C
D
E
J14
S13
J16
K
J
I
H
GS4
TB1-3
CB7
CB94
CB6
A2
B2
C2
P11/J1
X2
A2
X1
P5
C2
B2
A2
GENERATOR CONTACTOR NO.2 K-2
GS5
EXTERNAL POWER CONTACTOR K-7
GENERATOR CONTACTOR NO.1 K-1
P13/PM1J1
EXTERNAL POWER MONITOR

Ⓒ EXTERNAL POWER CONNECTOR THROUGH DOOR R345

Ⓔ GROUND SERVICE UTILITY CONNECTOR THROUGH DOOR B60R

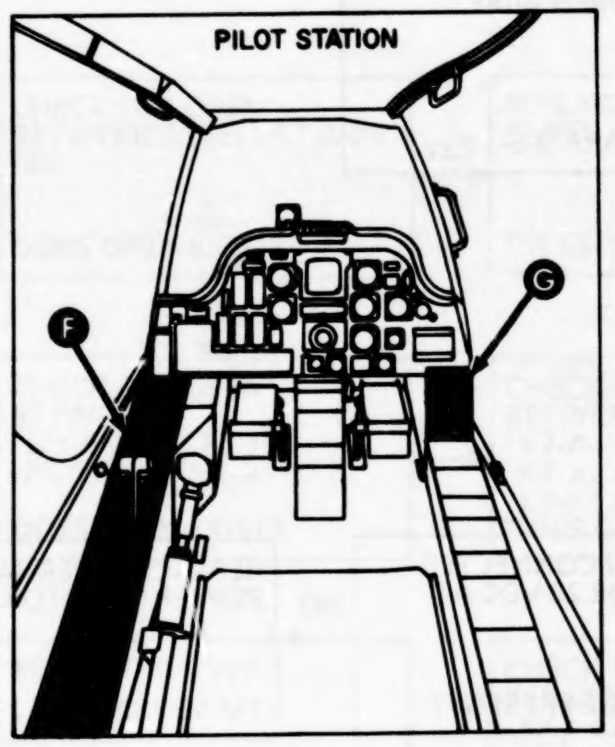
Ⓐ MAIN DECK THROUGH ACCESS PANEL R200

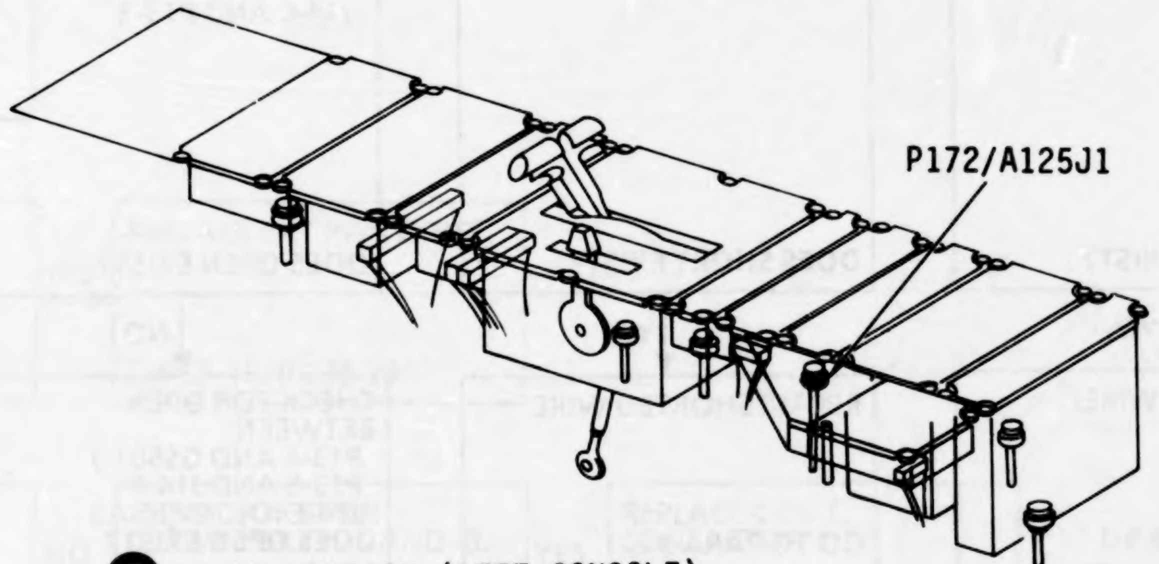
Ⓑ ELECTRICAL POWER DISTRIBUTION BOX (AFT VIEW)

Ⓓ AFT AVIONICS BAY THROUGH DOOR R295

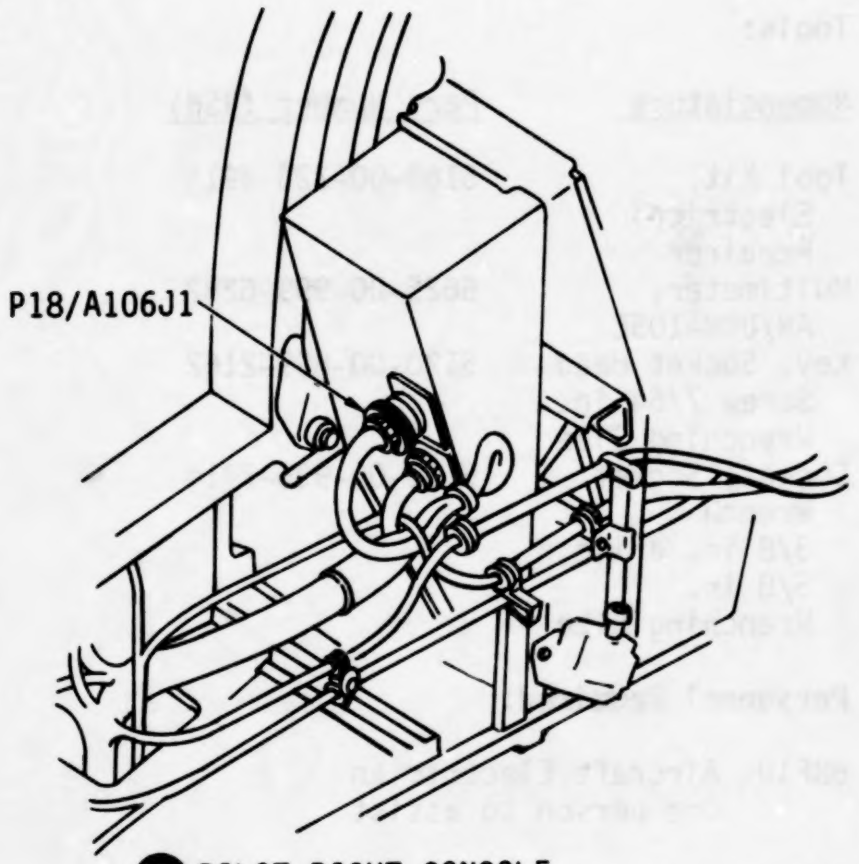
MM04/1-864-1D

9-5-5. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

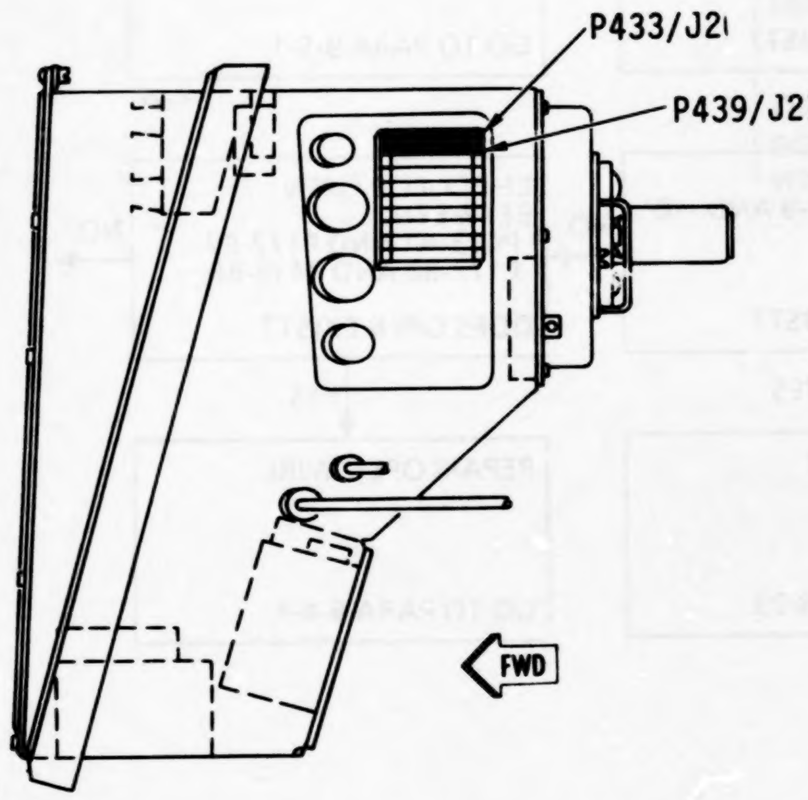

PILOT STATION
F
G


P172/A125J1

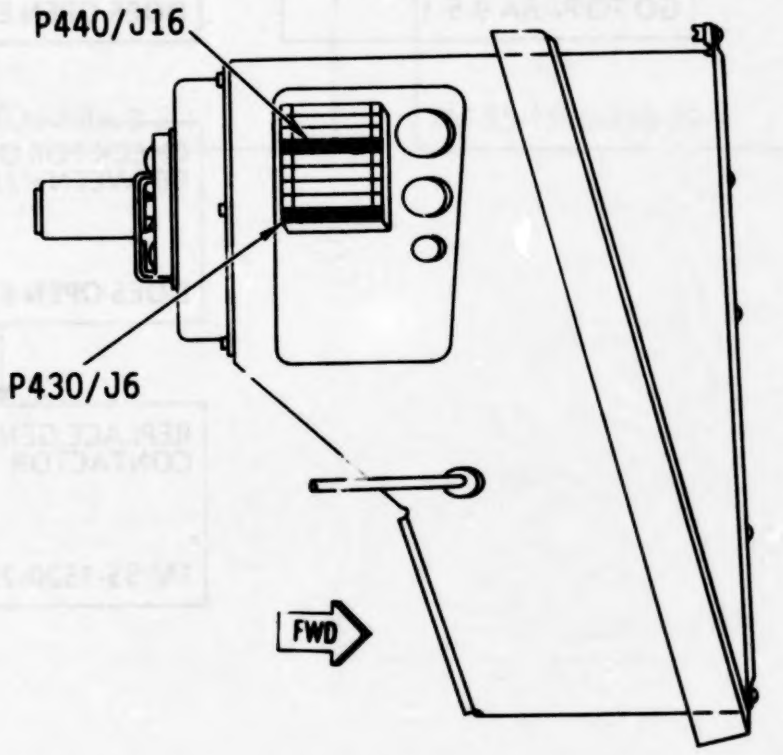
F PILOT STATION (LEFT CONSOLE)



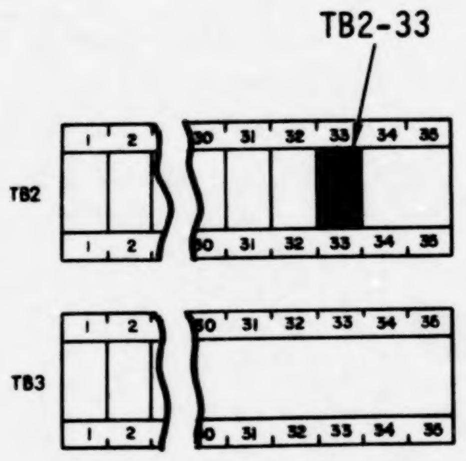
G PILOT RIGHT CONSOLE


P433/J20
P439/J21
FWD

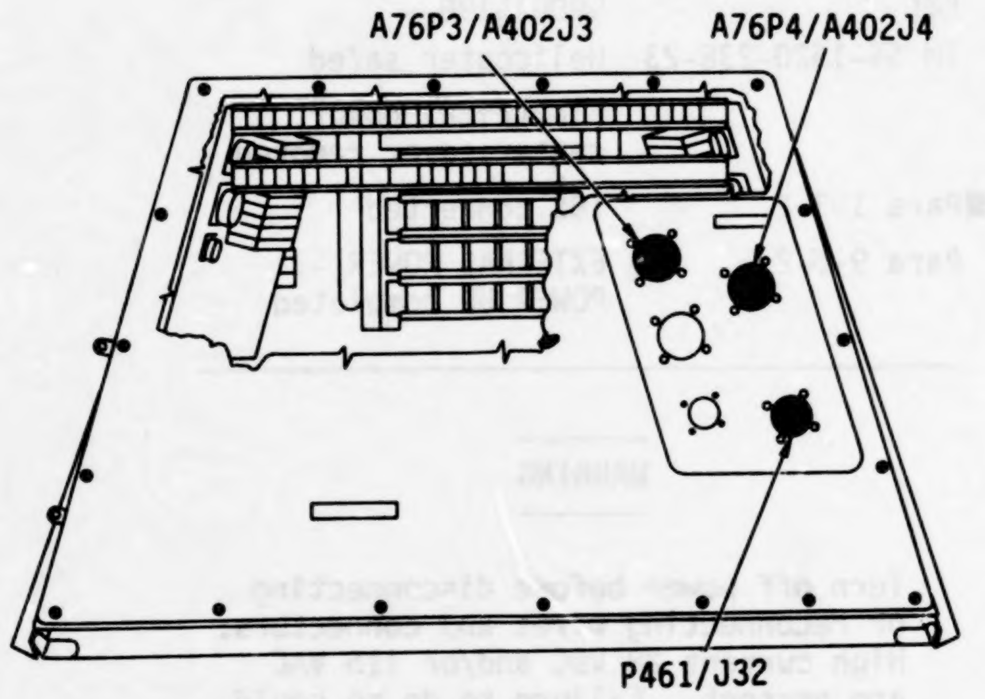
H ELECTRICAL POWER DISTRIBUTION BOX


P440/J16
P430/J6
FWD

I ELECTRICAL POWER DISTRIBUTION BOX


TB2-33
TB2
TB3
1 2
30 31 32 33 34 35

J ELECTRICAL POWER DISTRIBUTION BOX TERMINAL BOARD


A76P3/A402J3
A76P4/A402J4
P461/J32

K ELECTRICAL POWER DISTRIBUTION BOX (AFT VIEW)

MM04/1-864-2D

9-5-6. EXTERNAL POWER - DOES NOT COME THROUGH EXTERNAL POWER CONTACTOR

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282
Key, Socket Head Screw 7/64 in. Wrenching Size	5120-00-889-2162
Socket, Socket Wrench 3/8 in. drive, 5/8 in. Wrenching Size	5120-00-935-7414

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

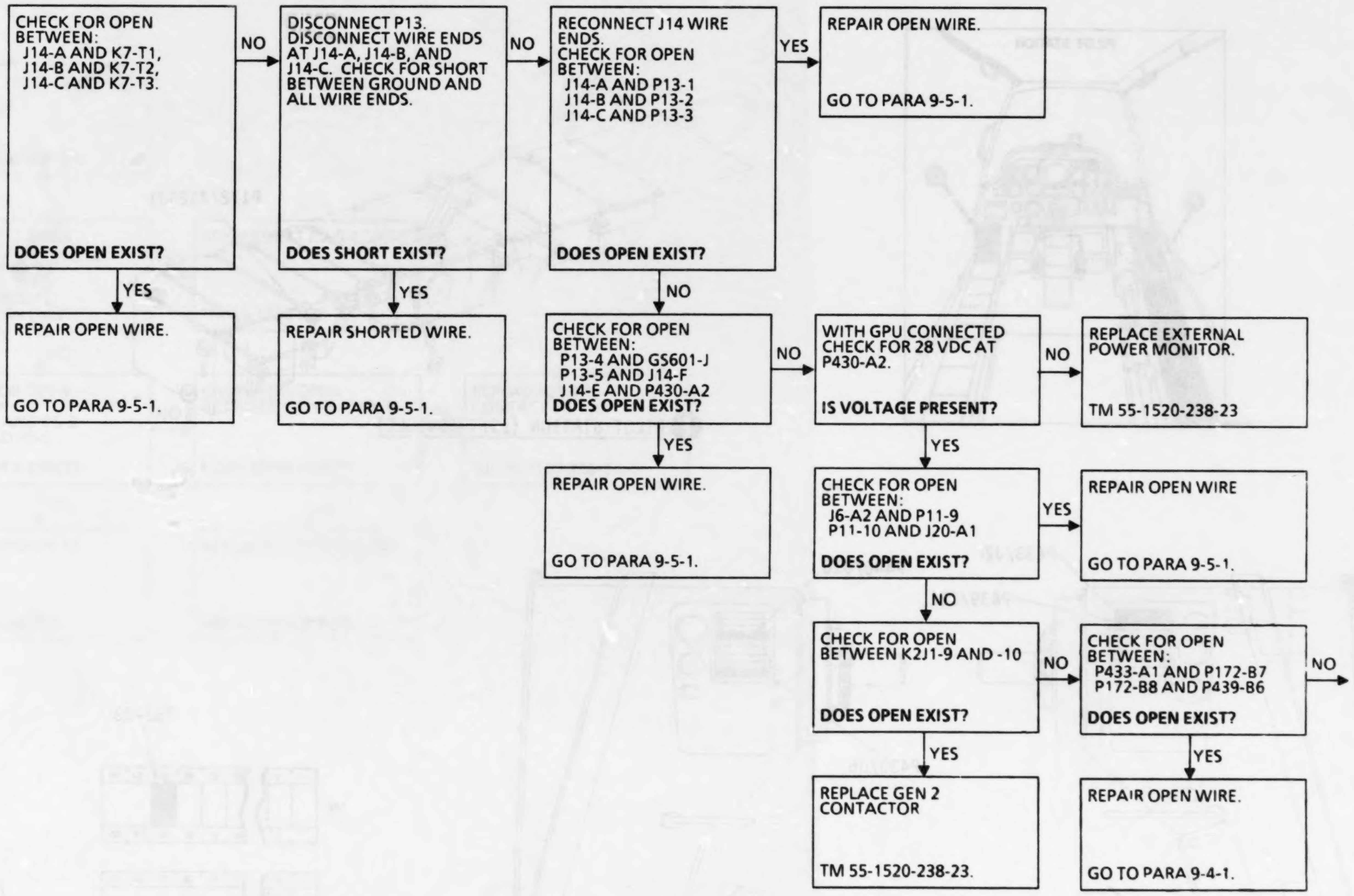
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed
Para 1-3-2	ICS connected
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR OPEN BETWEEN:
J14-A AND K7-T1,
J14-B AND K7-T2,
J14-C AND K7-T3.
DOES OPEN EXIST?

REPAIR OPEN WIRE.
GO TO PARA 9-5-1.

DISCONNECT P13. DISCONNECT WIRE ENDS AT J14-A, J14-B, AND J14-C. CHECK FOR SHORT BETWEEN GROUND AND ALL WIRE ENDS.
DOES SHORT EXIST?

REPAIR SHORTED WIRE.
GO TO PARA 9-5-1.

RECONNECT J14 WIRE ENDS. CHECK FOR OPEN BETWEEN:
J14-A AND P13-1
J14-B AND P13-2
J14-C AND P13-3
DOES OPEN EXIST?

REPAIR OPEN WIRE.
GO TO PARA 9-5-1.

CHECK FOR OPEN BETWEEN:
P13-4 AND GS601-J
P13-5 AND J14-F
J14-E AND P430-A2
DOES OPEN EXIST?

REPAIR OPEN WIRE.
GO TO PARA 9-5-1.

WITH GPU CONNECTED CHECK FOR 28 VDC AT P430-A2.
IS VOLTAGE PRESENT?

REPLACE EXTERNAL POWER MONITOR.
TM 55-1520-238-23

CHECK FOR OPEN BETWEEN:
J6-A2 AND P11-9
P11-10 AND J20-A1
DOES OPEN EXIST?

REPAIR OPEN WIRE
GO TO PARA 9-5-1.

CHECK FOR OPEN BETWEEN K2J1-9 AND -10
DOES OPEN EXIST?

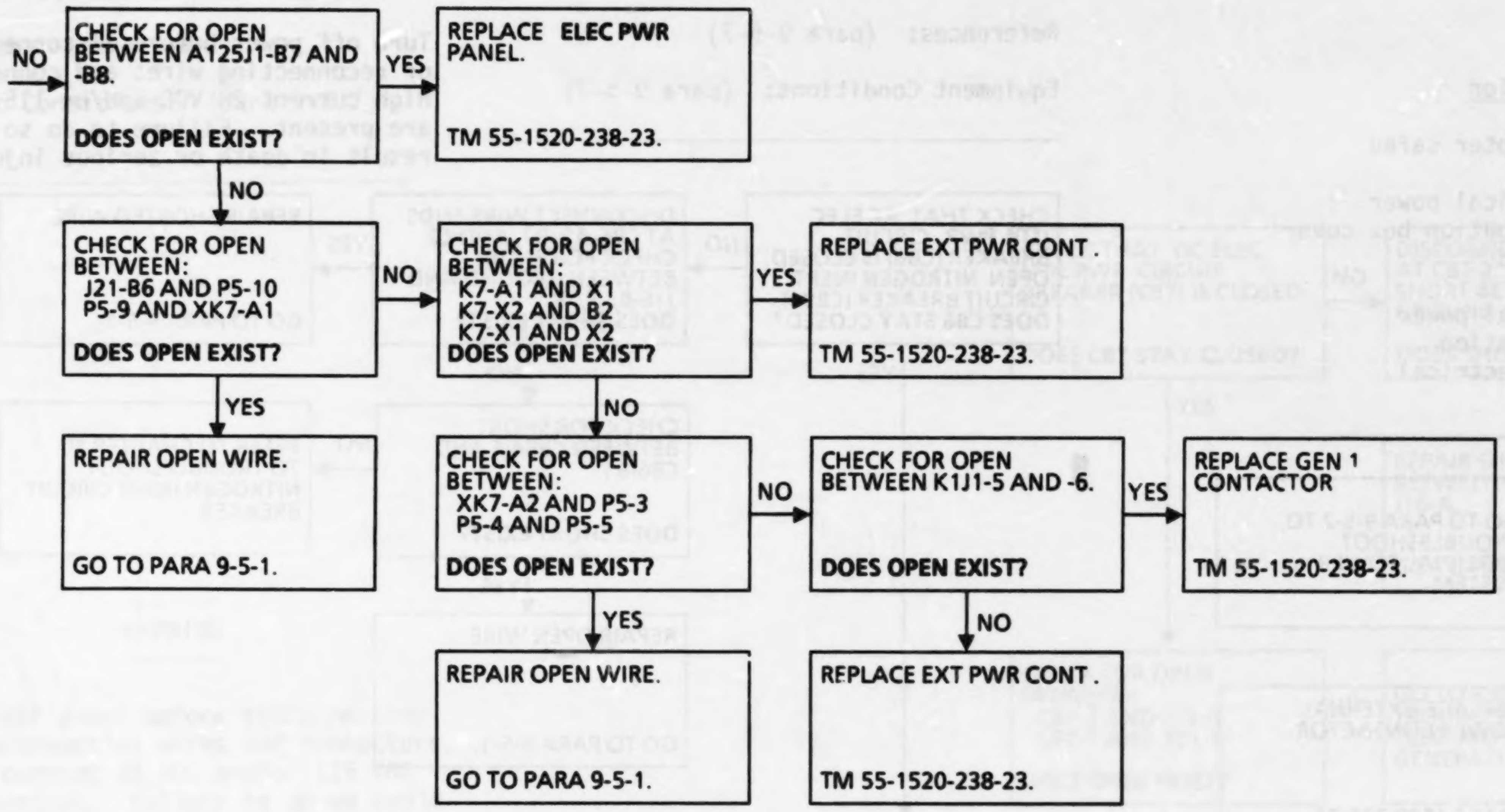
REPLACE GEN 2 CONTACTOR
TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN:
P433-A1 AND P172-B7
P172-B8 AND P439-B6
DOES OPEN EXIST?

REPAIR OPEN WIRE.
GO TO PARA 9-4-1.

GO TO NEXT PAGE

9-5-6. EXTERNAL POWER - DOES NOT COME THROUGH EXTERNAL POWER CONTACTOR (cont)


NO
CHECK FOR OPEN BETWEEN A125J1-B7 AND -B8.
DOES OPEN EXIST?
YES
REPLACE ELEC PWR PANEL.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN:
J21-B6 AND P5-10
P5-9 AND XK7-A1
DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN:
K7-A1 AND X1
K7-X2 AND B2
K7-X1 AND X2
DOES OPEN EXIST?
YES
REPLACE EXT PWR CONT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
NO
CHECK FOR OPEN BETWEEN:
XK7-A2 AND P5-3
P5-4 AND P5-5
DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN K1J1-5 AND -6.
DOES OPEN EXIST?
YES
REPLACE GEN 1 CONTACTOR
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
NO
REPLACE EXT PWR CONT.
TM 55-1520-238-23.

END OF TASK

9-5-7. GEN 1 CONTACTOR - DOES NOT CLOSE WITH EXTERNAL POWER APPLIED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

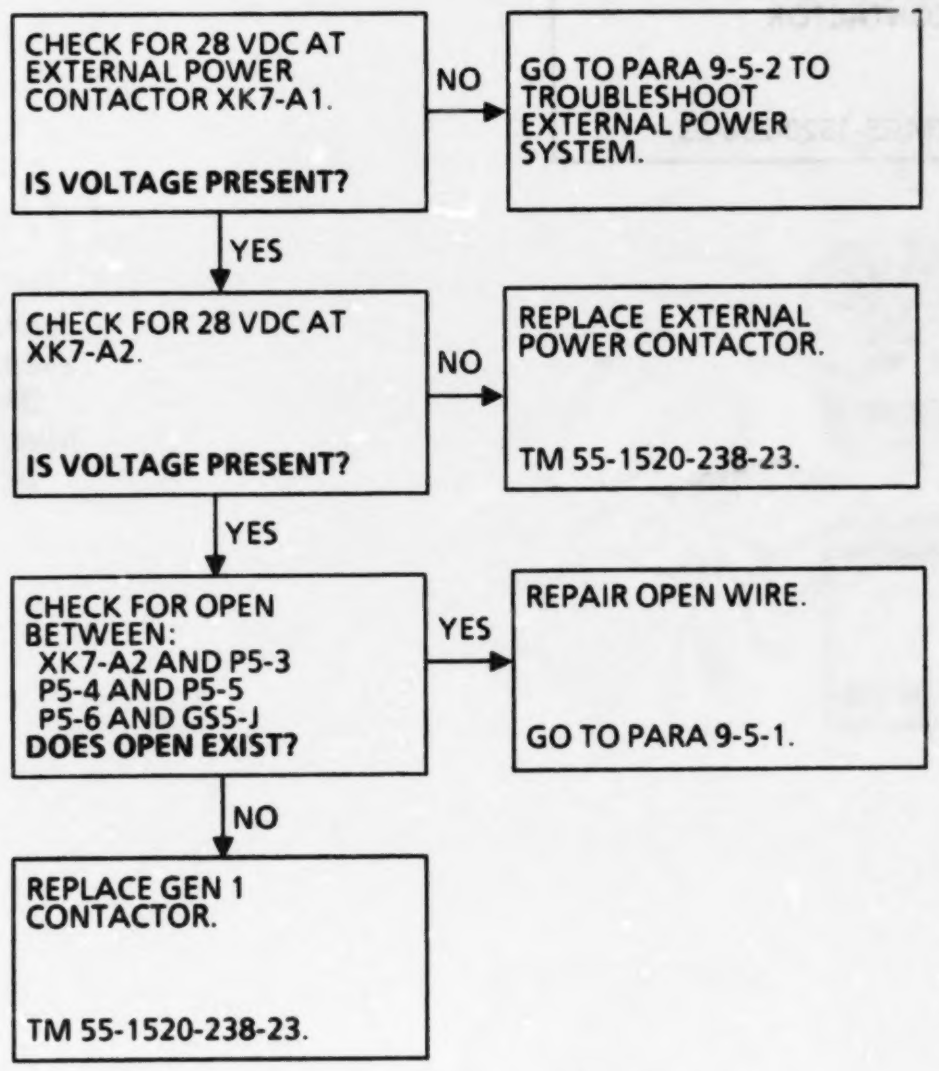
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power distribution box cover removed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT EXTERNAL POWER CONTACTOR XK7-A1.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-5-2 TO TROUBLESHOOT EXTERNAL POWER SYSTEM.
YES
CHECK FOR 28 VDC AT XK7-A2.
IS VOLTAGE PRESENT?
NO
REPLACE EXTERNAL POWER CONTACTOR.
TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN:
XK7-A2 AND P5-3
P5-4 AND P5-5
P5-6 AND GS5-J
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
NO
REPLACE GEN 1 CONTACTOR.
TM 55-1520-238-23.

END OF TASK

9-5-8. GROUND UTILITY SERVICE CONNECTOR - DOES NOT HAVE AC POWER

Tools: (para 9-5-7)

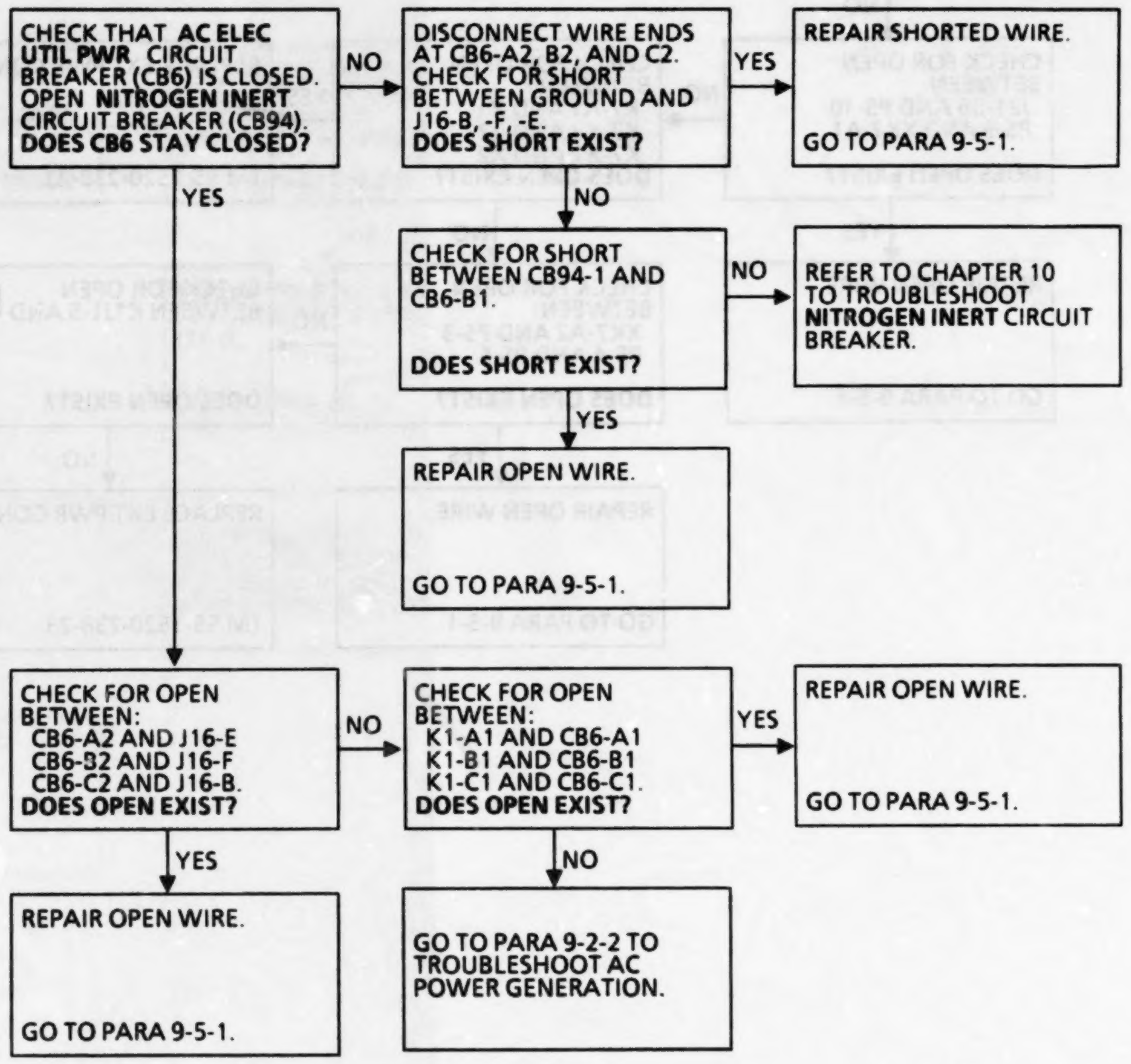
Personnel Required: (para 9-5-7)

References: (para 9-5-7)

Equipment Conditions: (para 9-5-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK THAT AC ELEC UTIL PWR CIRCUIT BREAKER (CB6) IS CLOSED. OPEN NITROGEN INERT CIRCUIT BREAKER (CB94). DOES CB6 STAY CLOSED?
NO
DISCONNECT WIRE ENDS AT CB6-A2, B2, AND C2. CHECK FOR SHORT BETWEEN GROUND AND J16-B, -F, -E. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-5-1.
NO
CHECK FOR SHORT BETWEEN CB94-1 AND CB6-B1.
DOES SHORT EXIST?
NO
REFER TO CHAPTER 10 TO TROUBLESHOOT NITROGEN INERT CIRCUIT BREAKER.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
YES
CHECK FOR OPEN BETWEEN:
CB6-A2 AND J16-E
CB6-B2 AND J16-F
CB6-C2 AND J16-B.
DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN:
K1-A1 AND CB6-A1
K1-B1 AND CB6-B1
K1-C1 AND CB6-C1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
NO
GO TO PARA 9-2-2 TO TROUBLESHOOT AC POWER GENERATION.

END OF TASK

9-5-9. GROUND SERVICE UTILITY RECEPTACLE - DOES NOT HAVE DC POWER

Tools: (para 9-5-7)

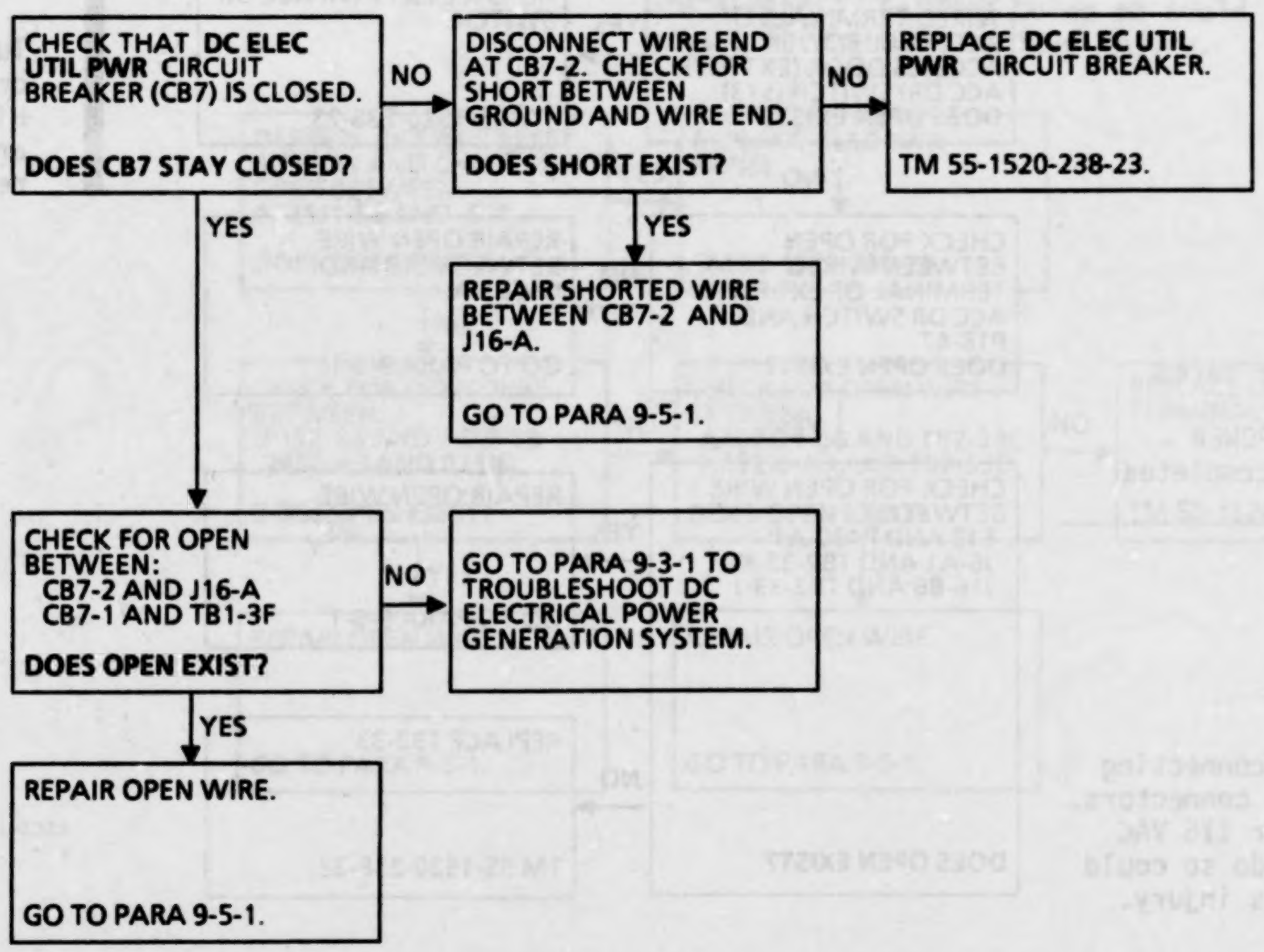
Personnel Required: (para 9-5-7)

References: (para 9-5-7)

Equipment Conditions: (para 9-5-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK THAT DC ELEC UTIL PWR CIRCUIT BREAKER (CB7) IS CLOSED.
DOES CB7 STAY CLOSED?
NO
DISCONNECT WIRE END AT CB7-2. CHECK FOR SHORT BETWEEN GROUND AND WIRE END.
DOES SHORT EXIST?
NO
REPLACE DC ELEC UTIL PWR CIRCUIT BREAKER.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN CB7-2 AND J16-A.
GO TO PARA 9-5-1.
YES
CHECK FOR OPEN BETWEEN:
CB7-2 AND J16-A
CB7-1 AND TB1-3F
DOES OPEN EXIST?
NO
GO TO PARA 9-3-1 TO TROUBLESHOOT DC ELECTRICAL POWER GENERATION SYSTEM.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.

END OF TASK

9-5-10. EXT PWR INDICATOR - IS NOT LIGHTED WHEN EXTERNAL POWER ACCESS DOOR IS OPEN

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

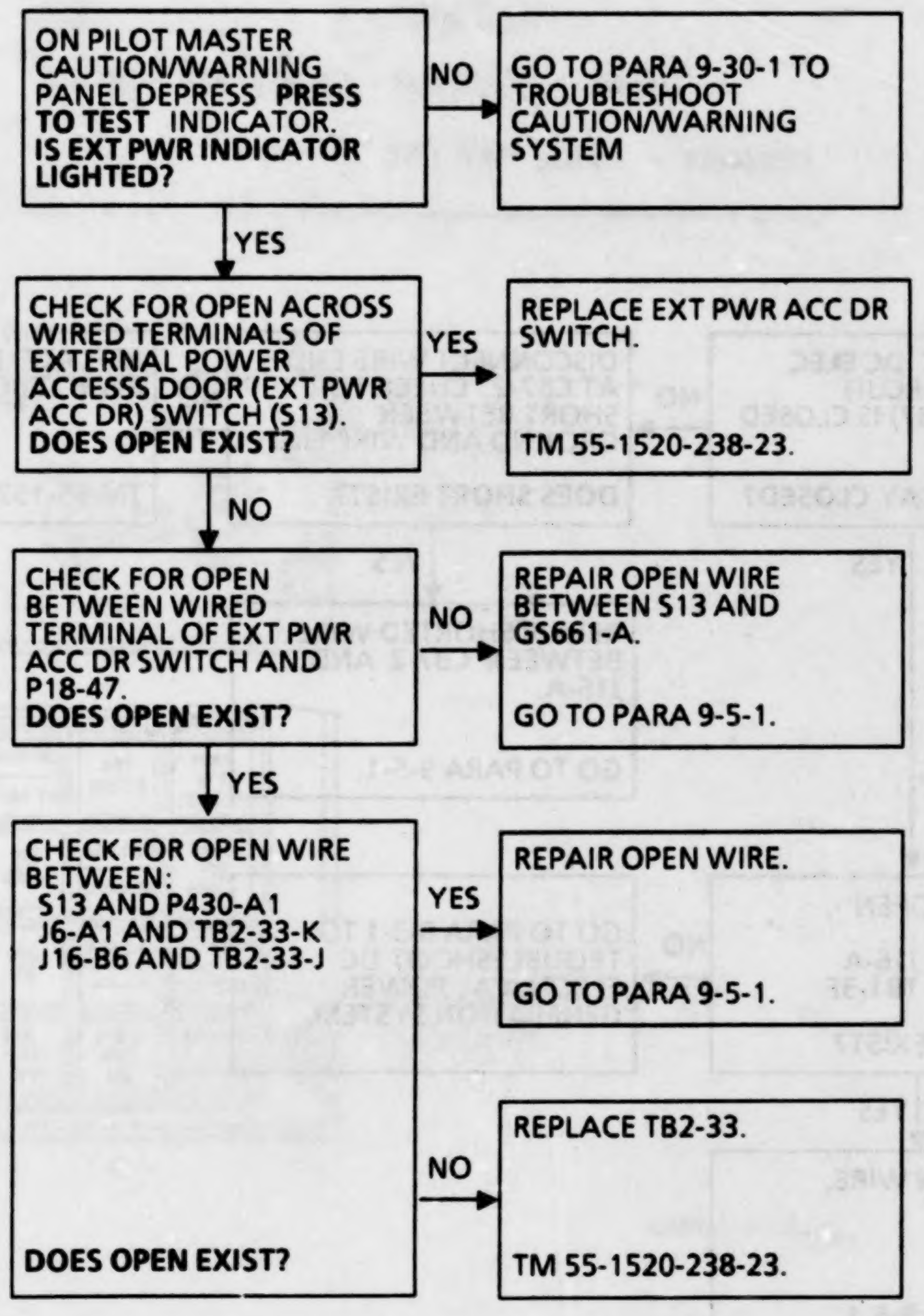
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON PILOT MASTER CAUTION/WARNING PANEL DEPRESS PRESS TO TEST INDICATOR. IS EXT PWR INDICATOR LIGHTED?
NO
GO TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM
YES
CHECK FOR OPEN ACROSS WIRED TERMINALS OF EXTERNAL POWER ACCESSS DOOR (EXT PWR ACC DR) SWITCH (S13). DOES OPEN EXIST?
YES
REPLACE EXT PWR ACC DR SWITCH.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN WIRED TERMINAL OF EXT PWR ACC DR SWITCH AND P18-47. DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN S13 AND GS661-A.
GO TO PARA 9-5-1.
YES
CHECK FOR OPEN WIRE BETWEEN: S13 AND P430-A1 J6-A1 AND TB2-33-K J16-B6 AND TB2-33-J
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
DOES OPEN EXIST?
NO
REPLACE TB2-33.
TM 55-1520-238-23.

END OF TASK

9-5-11. EXT PWR INDICATOR - IS LIGHTED WHEN EXTERNAL POWER ACCESS DOOR IS CLOSED

Tools: (para 9-5-10)

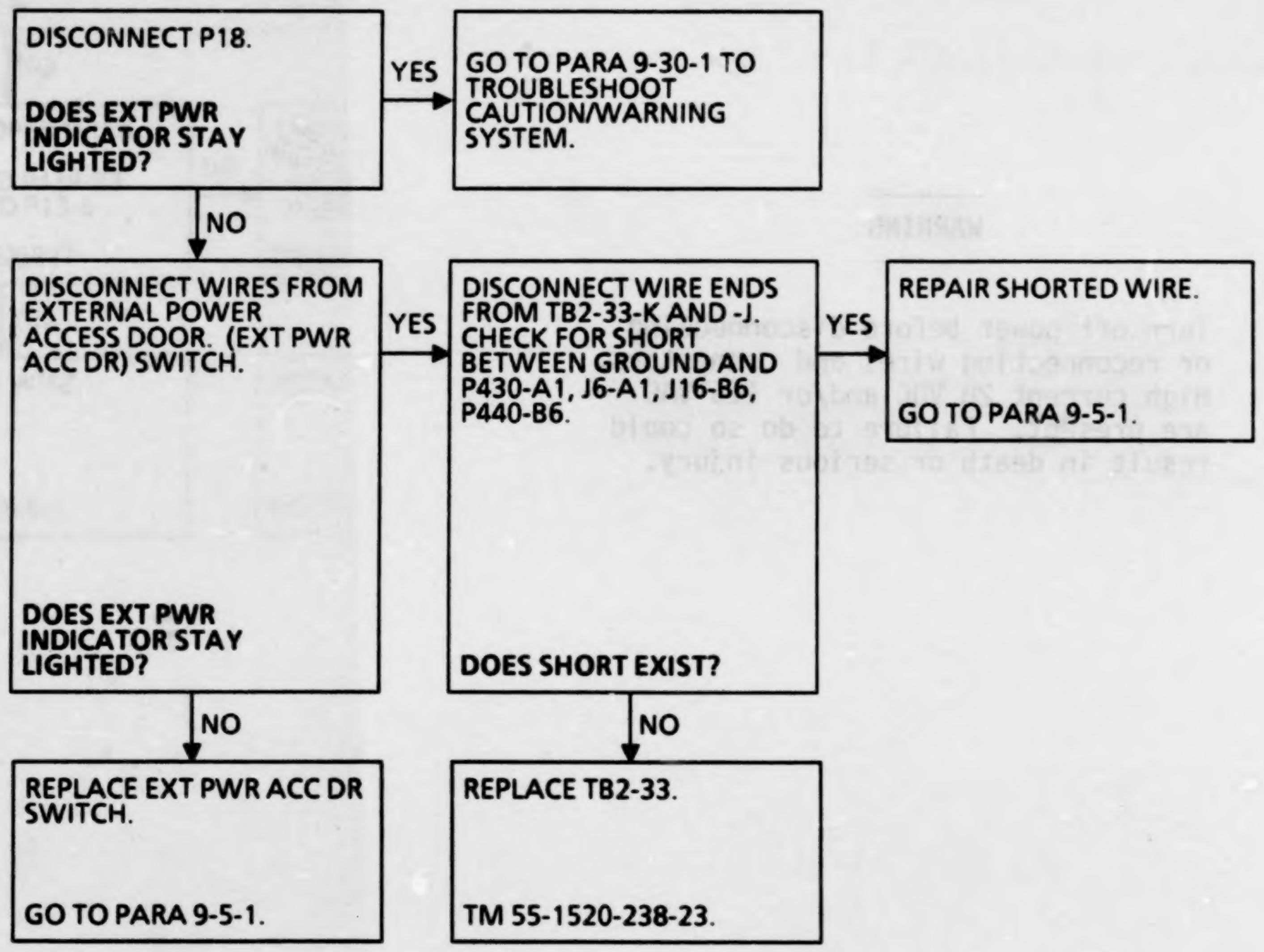
Personnel Required: (para 9-5-10)

References: (para 9-5-10)

Equipment Conditions: (para 9-5-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P18.
DOES EXT PWR INDICATOR STAY LIGHTED?
YES
GO TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.
NO
DISCONNECT WIRES FROM EXTERNAL POWER ACCESS DOOR. (EXT PWR ACC DR) SWITCH.
DOES EXT PWR INDICATOR STAY LIGHTED?
YES
DISCONNECT WIRE ENDS FROM TB2-33-K AND -J. CHECK FOR SHORT BETWEEN GROUND AND P430-A1, J6-A1, J16-B6, P440-B6.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-5-1.
NO
REPLACE EXT PWR ACC DR SWITCH.
GO TO PARA 9-5-1.
NO
REPLACE TB2-33.
TM 55-1520-238-23.

END OF TASK

9-5-12. ELECTRICAL POWER DOES NOT COME ON AFTER EXT PWR RESET BUTTON HAS BEEN DEPRESSED

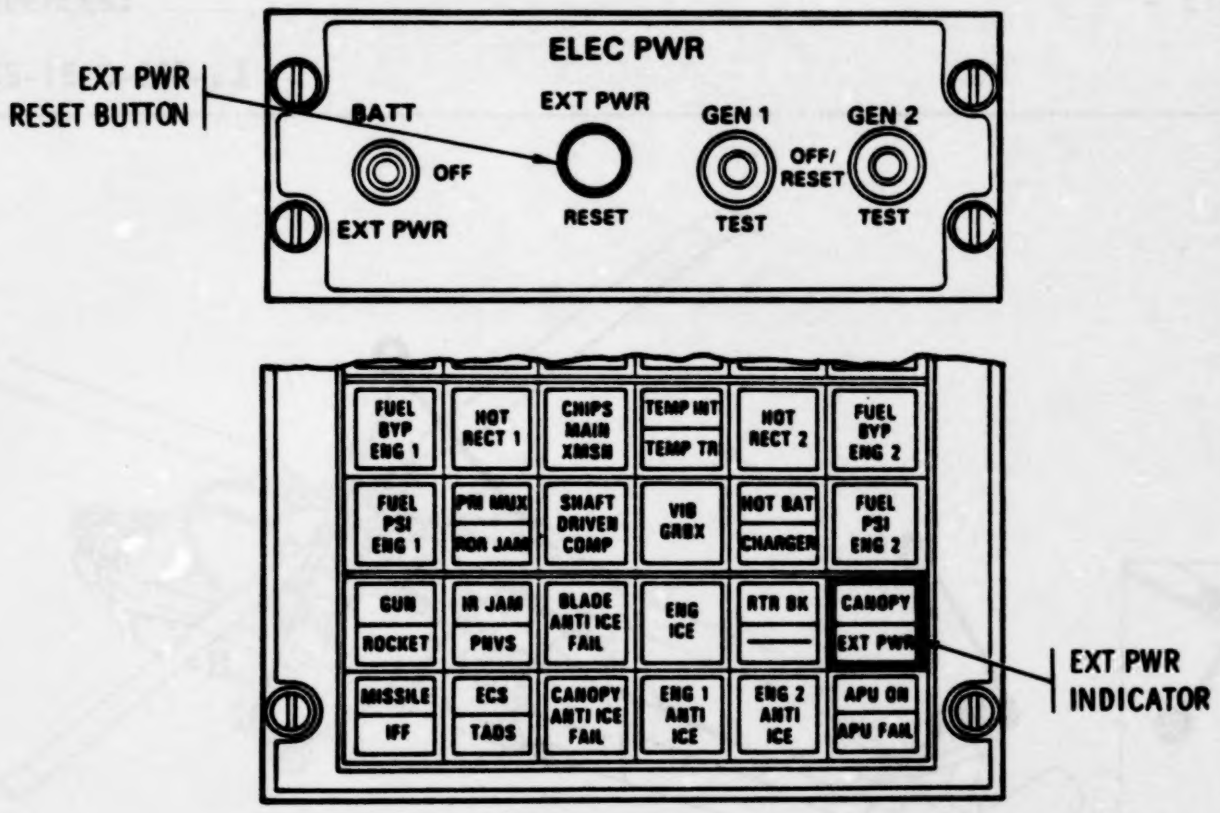
Tools: (para 9-5-10)

Personnel Required: (para 9-5-10)

References: (para 9-5-10)

Equipment Conditions:

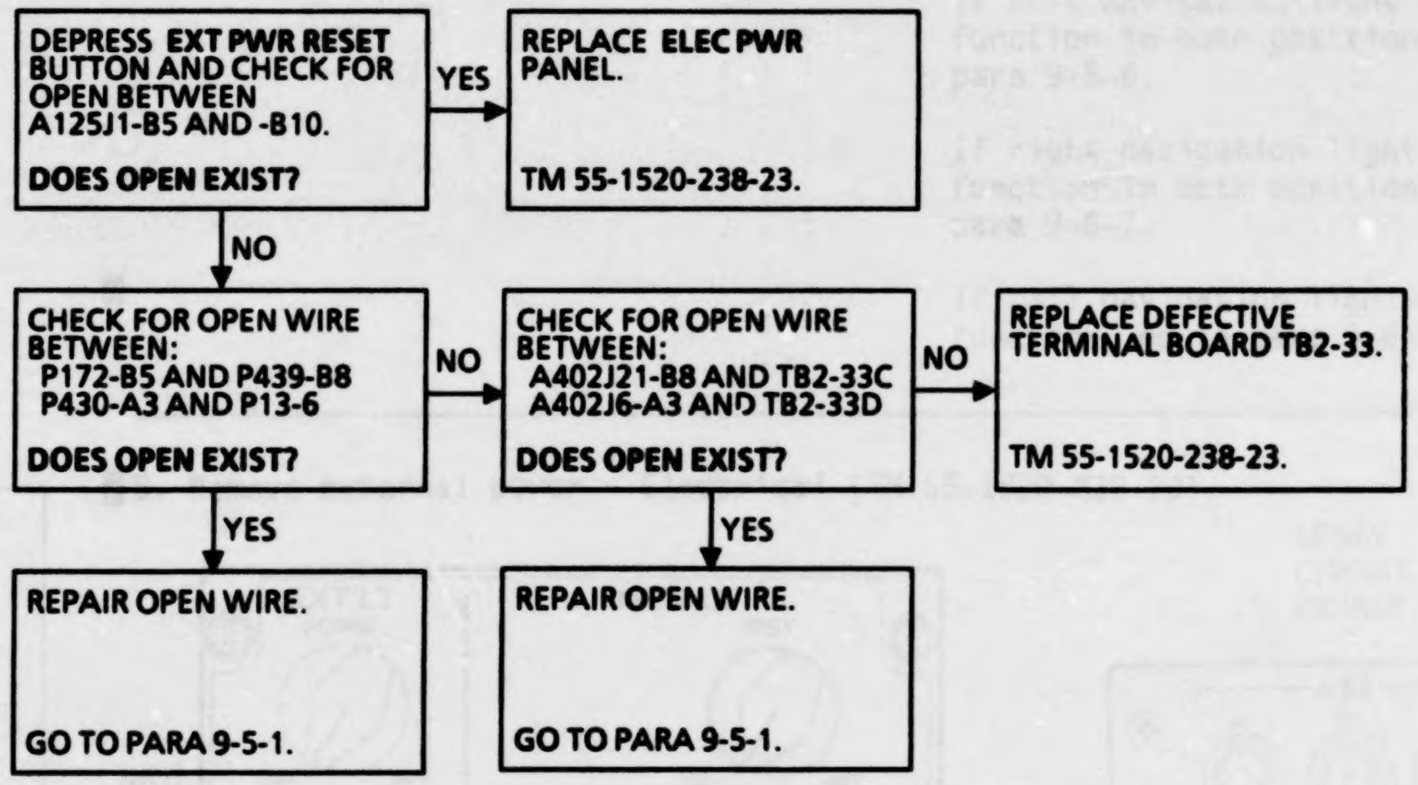
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	EXT PWR panel - removed


ELEC PWR
EXT PWR RESET BUTTON
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
OFF/ RESET
TEST
GEN 2
TEST
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL
EXT PWR INDICATOR

MM04/1-1316

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DEPRESS EXT PWR RESET BUTTON AND CHECK FOR OPEN BETWEEN A125J1-B5 AND -B10.
DOES OPEN EXIST?
YES
REPLACE ELEC PWR PANEL.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P172-B5 AND P439-B8 P430-A3 AND P13-6
DOES OPEN EXIST?
NO
CHECK FOR OPEN WIRE BETWEEN: A402J21-B8 AND TB2-33C A402J6-A3 AND TB2-33D
DOES OPEN EXIST?
NO
REPLACE DEFECTIVE TERMINAL BOARD TB2-33.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.

END OF TASK

9-6-1. NAVIGATION LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

References:

TM 55-1520-238-23

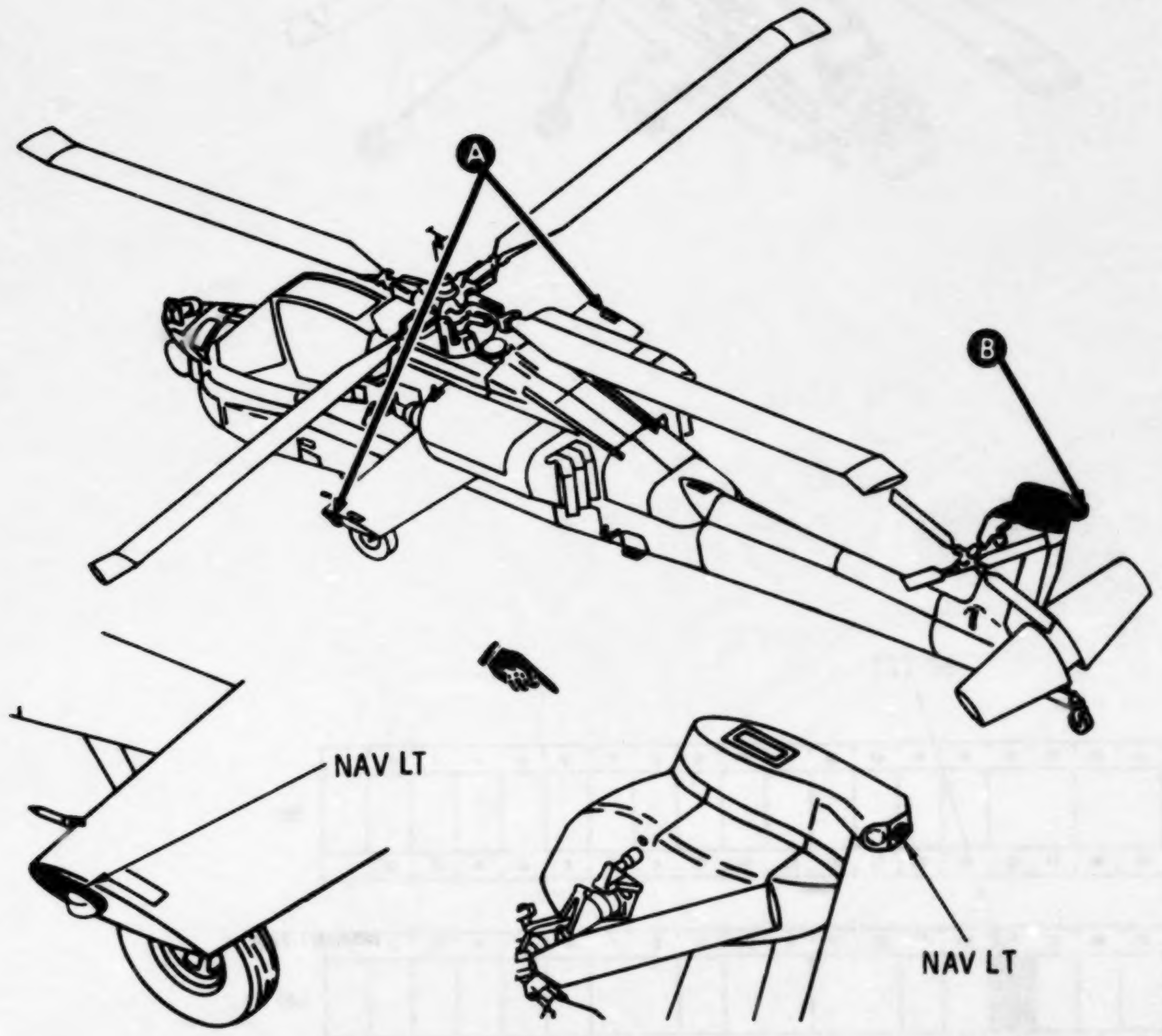
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Navigation lights visual inspection performed
	External power application - Electrical

A. Perform operational check as follows:

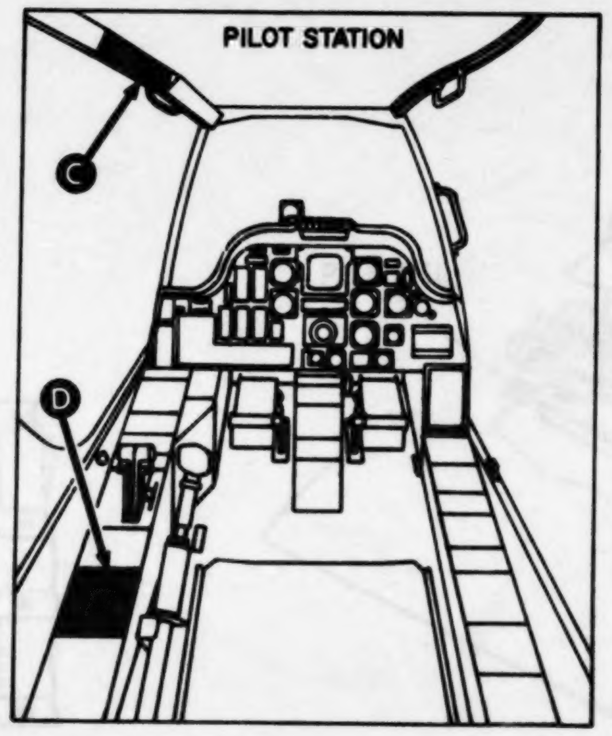
TASK	RESULT
1. On pilot circuit breaker panel, check that LT NAV circuit breaker is closed.	If LT NAV circuit breaker does not stay closed, go to para 9-6-5.
2. On EXT LT/INTR LT panel, set NAV switch to DIM position, and then to BRT position. Check that left, right, and tail navigation lights function in each position.	If LT NAV circuit breaker does not stay closed, go to para 9-6-5. If left, right, and tail navigation lights do not function, go to para 9-6-4. If left navigation light does not function in both positions, go to para 9-6-6. If right navigation light does not function in both positions, go to para 9-6-7. If tail navigation light does not function, go to para 9-6-8.

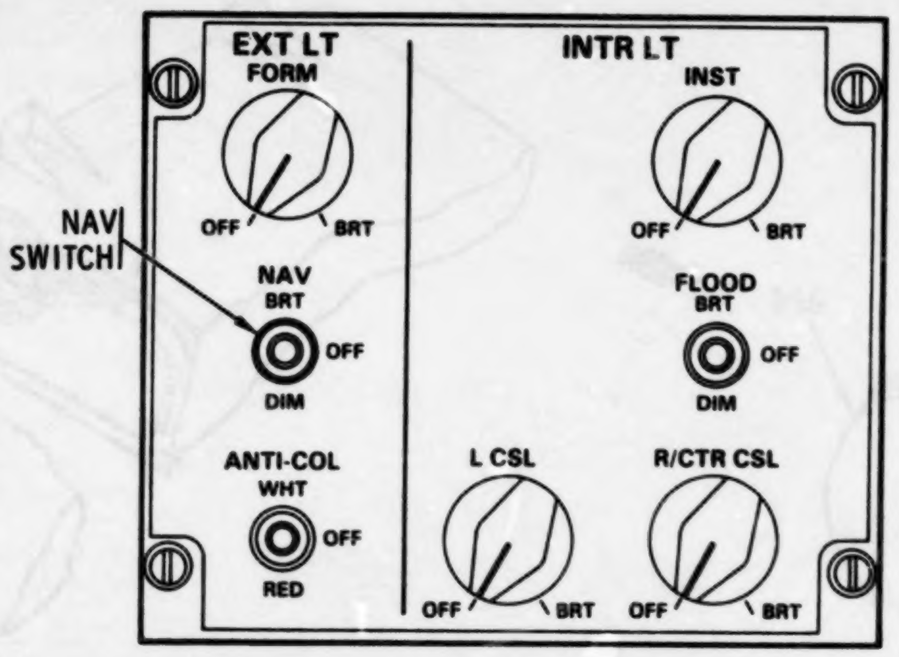
B. Remove external power - Electrical (TM 55-1520-238-23).


A
B
NAV LT
NAV LT

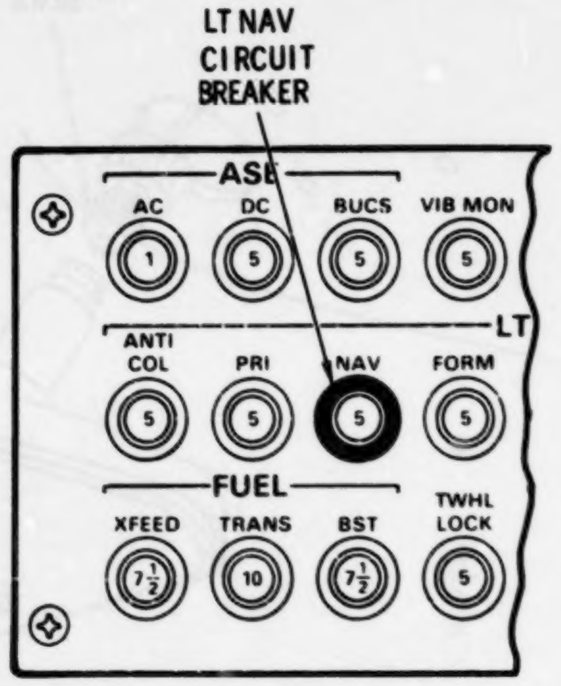
Ⓐ WING NAVIGATION LIGHTS (TYPICAL)

Ⓑ TAIL NAVIGATION LIGHT


PILOT STATION
C
D


NAV SWITCH
EXT LT
FORM
OFF
BRT
NAV
BRT
OFF
DIM
ANTI-COL
WHT
OFF
RED
INTR LT
INST
OFF
BRT
FLOOD
BRT
OFF
DIM
L CSL
OFF
BRT
R/CTR CSL
OFF
BRT

Ⓓ PILOT EXT LT/INTR LT PANEL

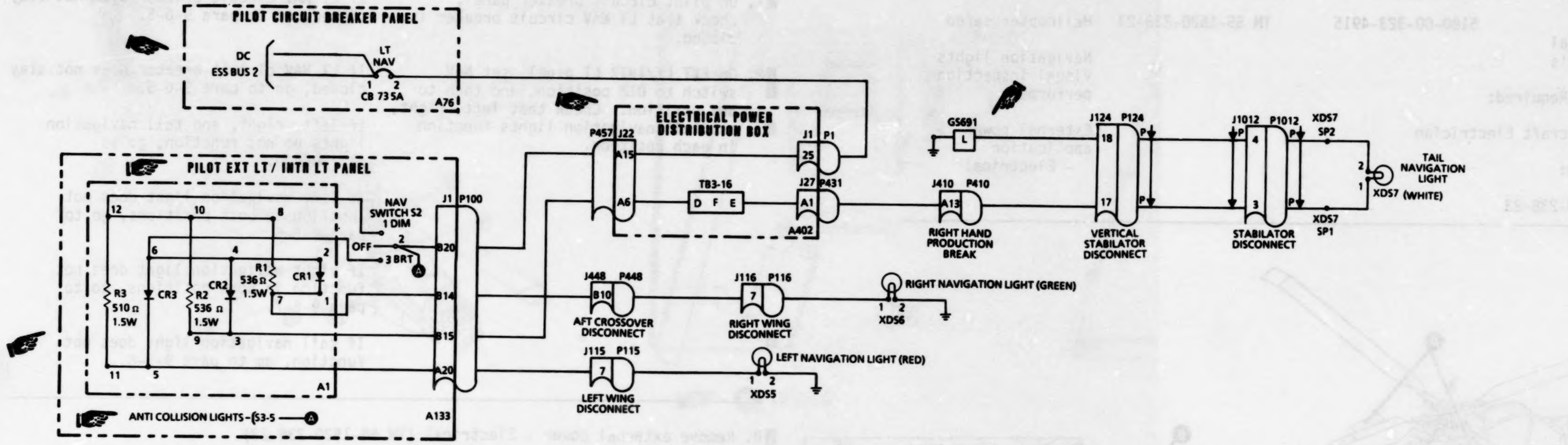

LT NAV CIRCUIT BREAKER
ASE
AC
DC
BUCS
VIB MON
LT
ANTI COL
PRI
NAV
FORM
FUEL
XFEED
TRANS
BST
TWHL LOCK
1
5
5
5
5
5
5
5
7½
10
7½
5

Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1019C

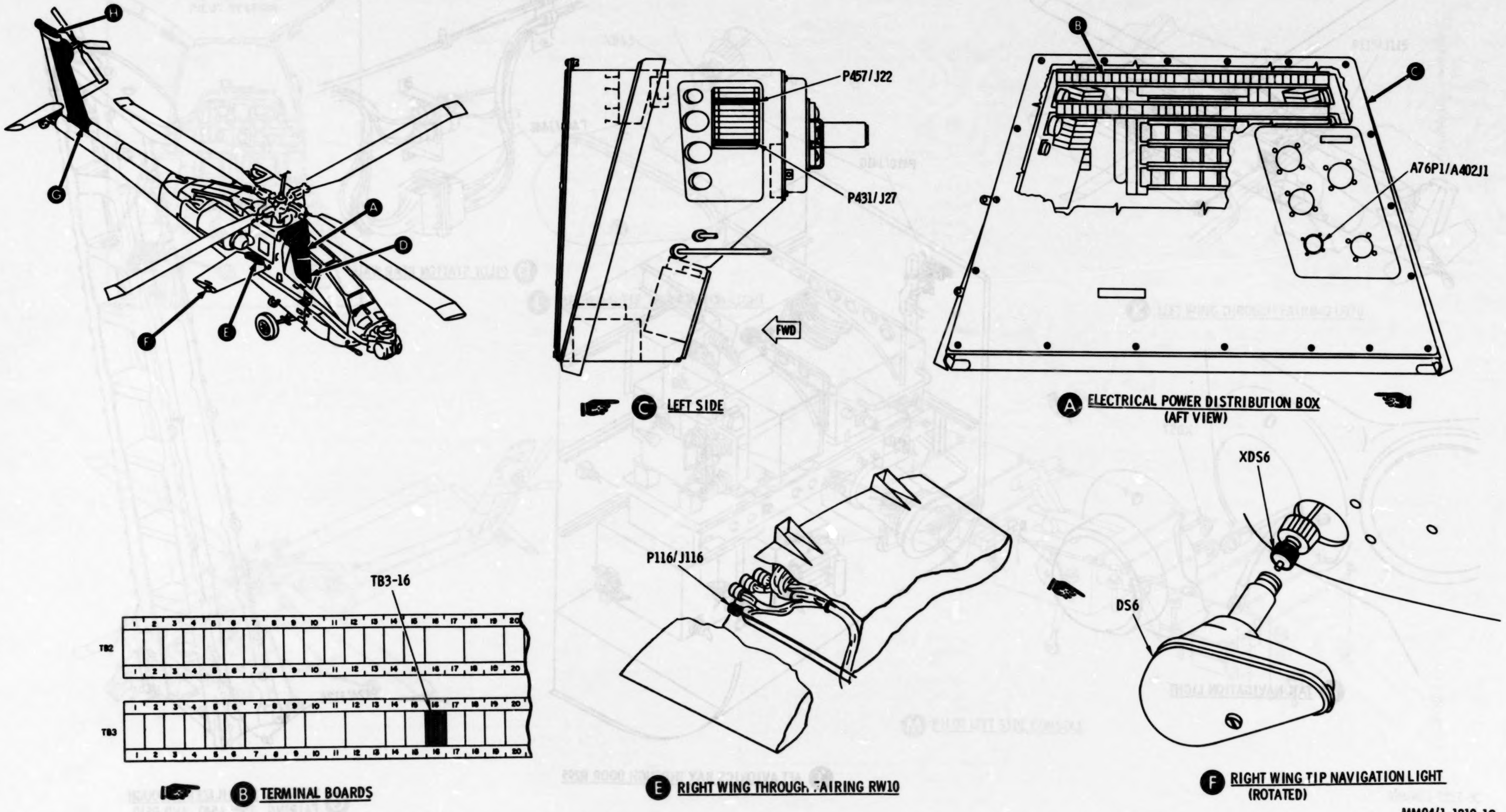
END OF TASK

9-6-2. NAVIGATION LIGHTS - INTERCONNECTION DIAGRAM


PILOT CIRCUIT BREAKER PANEL
DC
ESS BUS 2
LT
NAV
1
2
CB 73 5A
A76
ELECTRICAL POWER
DISTRIBUTION BOX
P457
J22
A15
A6
TB3-16
D F E
J1
P1
25
J27
P431
A1
A402
PILOT EXT LT / INTR LT PANEL
12
10
8
6
4
2
R1
536 Ω
1.5W
CR1
CR2
7
1
R3
510 Ω
1.5W
CR3
R2
536 Ω
1.5W
9
3
11
5
A1
NAV
SWITCH S2
1 DIM
2
OFF
3 BRT
J1
P100
B20
B14
B15
A20
A133
ANTI COLLISION LIGHTS -(S3-5
J448
P448
B10
AFT CROSSOVER
DISCONNECT
J116
P116
7
RIGHT WING
DISCONNECT
RIGHT NAVIGATION LIGHT (GREEN)
1
2
XDS6
J115
P115
7
LEFT WING
DISCONNECT
LEFT NAVIGATION LIGHT (RED)
1
2
XDS5
GS691
L
J410
P410
A13
RIGHT HAND
PRODUCTION
BREAK
J124
P124
18
17
P
P
VERTICAL
STABILATOR
DISCONNECT
J1012
P1012
4
3
P
P
STABILATOR
DISCONNECT
XDS7
SP2
XDS7
SP1
2
1
XDS7
TAIL
NAVIGATION
LIGHT
(WHITE)

MM04/1-726D

9-6-3. NAVIGATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


H
G
A
D
F
E
P457/J22
P431/J27
FWD
B
C
A76P1/A402J1
XDS6
DS6
TB3-16
TB2
TB3
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
P116/J116

Ⓒ LEFT SIDE

Ⓐ ELECTRICAL POWER DISTRIBUTION BOX (AFT VIEW)

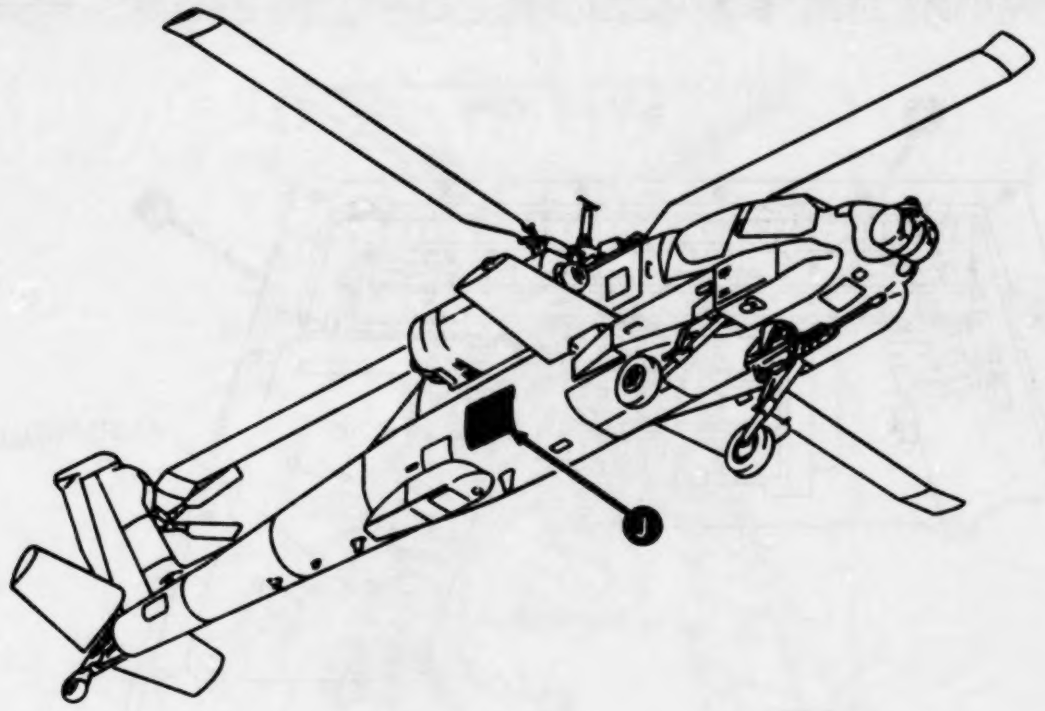
Ⓑ TERMINAL BOARDS (AFT VIEW)

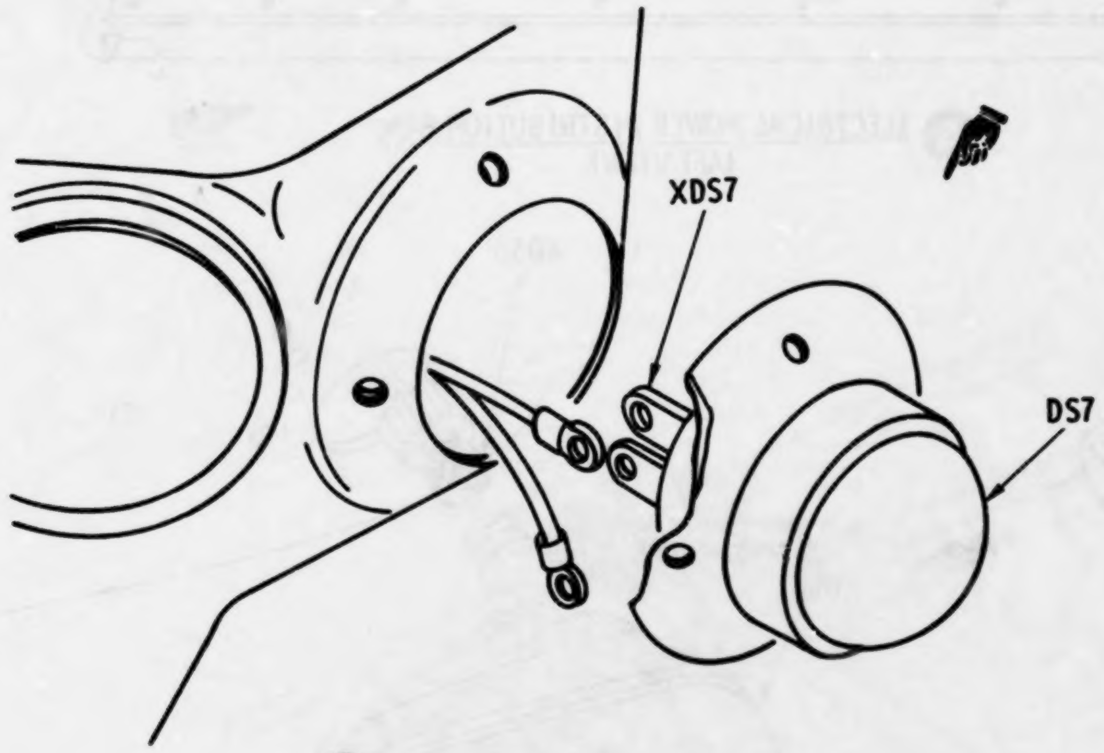
Ⓔ RIGHT WING THROUGH FAIRING RW10

Ⓕ RIGHT WING TIP NAVIGATION LIGHT (ROTATED)

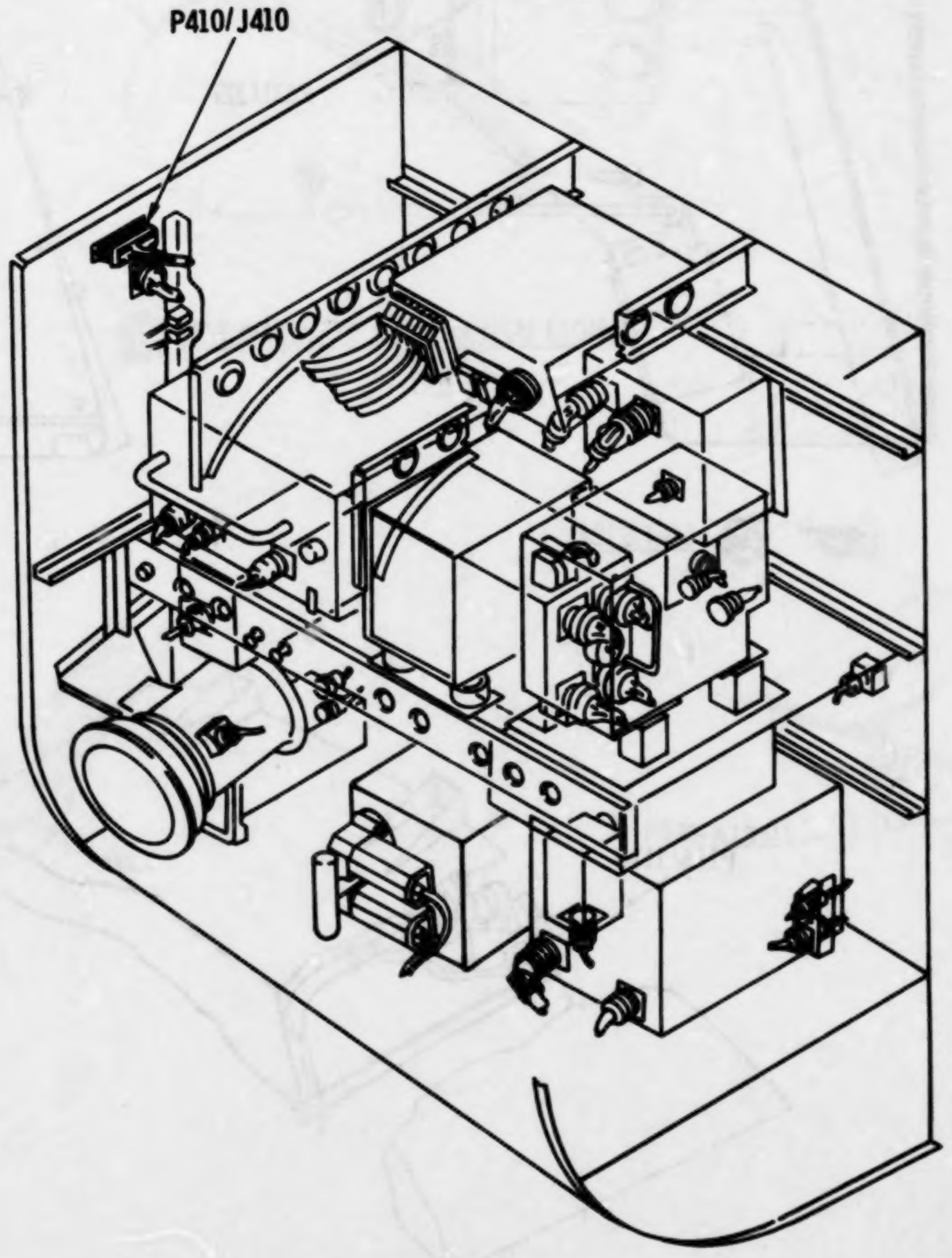
MM04/1-1219-1C

9-6-3. NAVIGATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

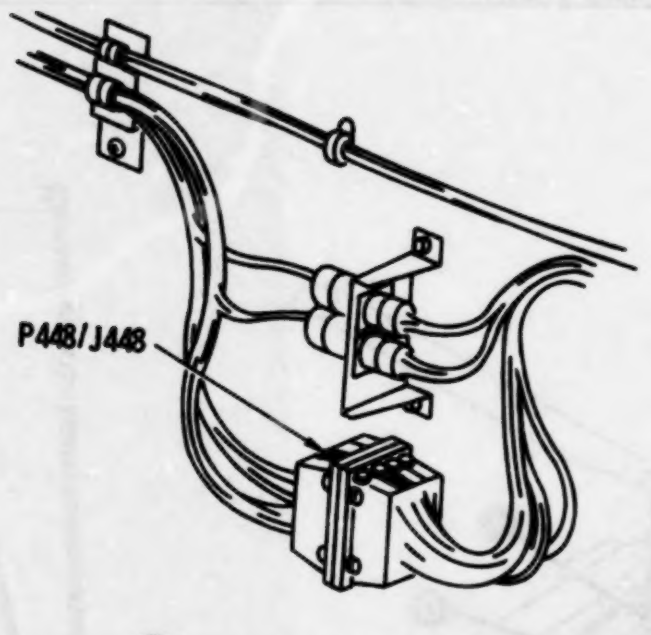




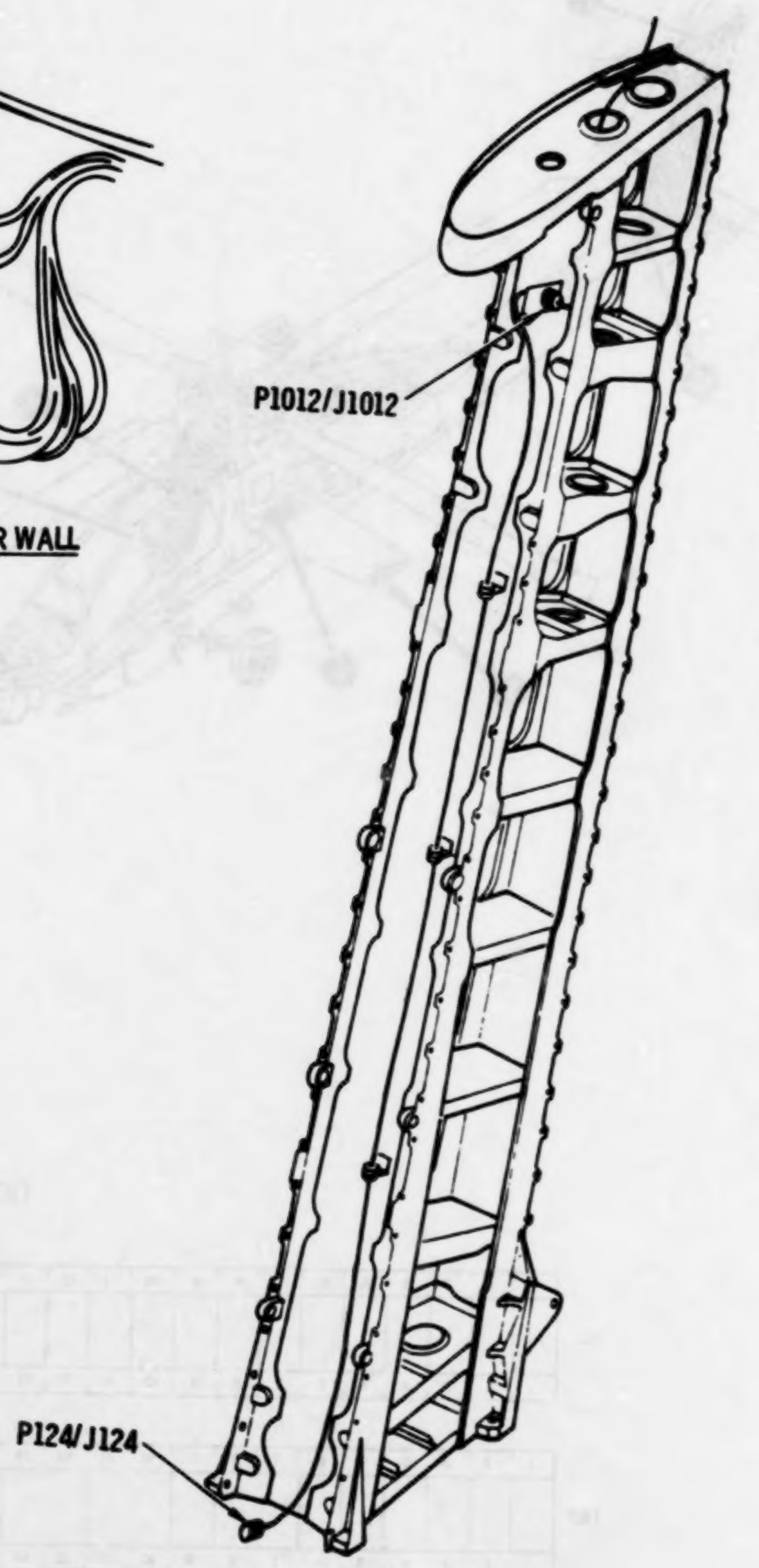
H TAIL NAVIGATION LIGHT



J AFT AVIONICS BAY THROUGH DOOR R295



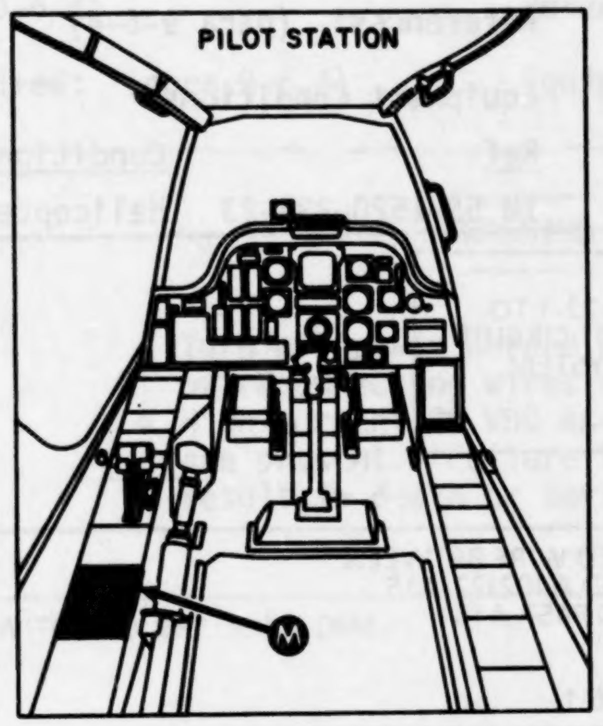
D PILOT STATION REAR WALL

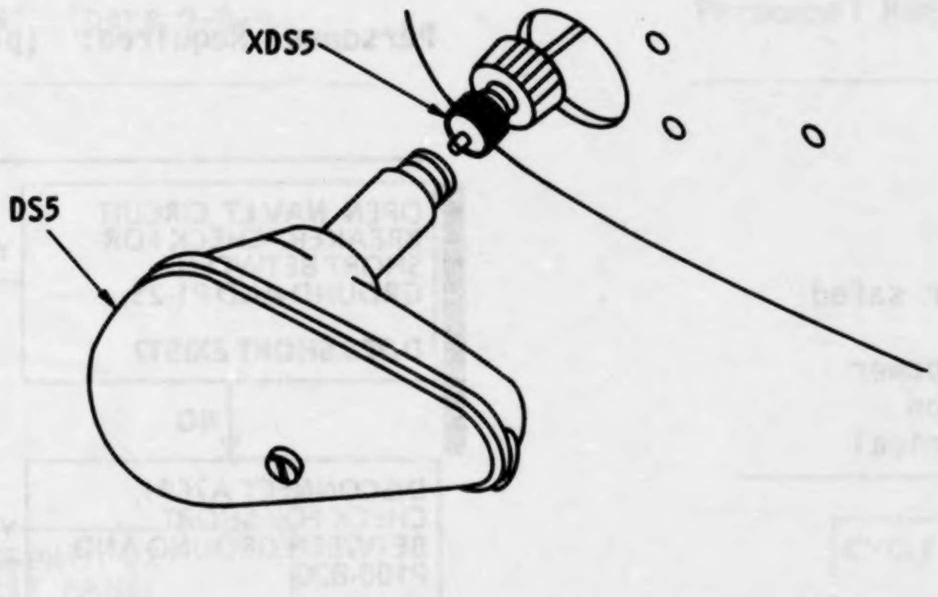

P1012/J1012
P124/J124

G VERTICAL STABILIZER THROUGH FAIRING T545, L540, AND R510

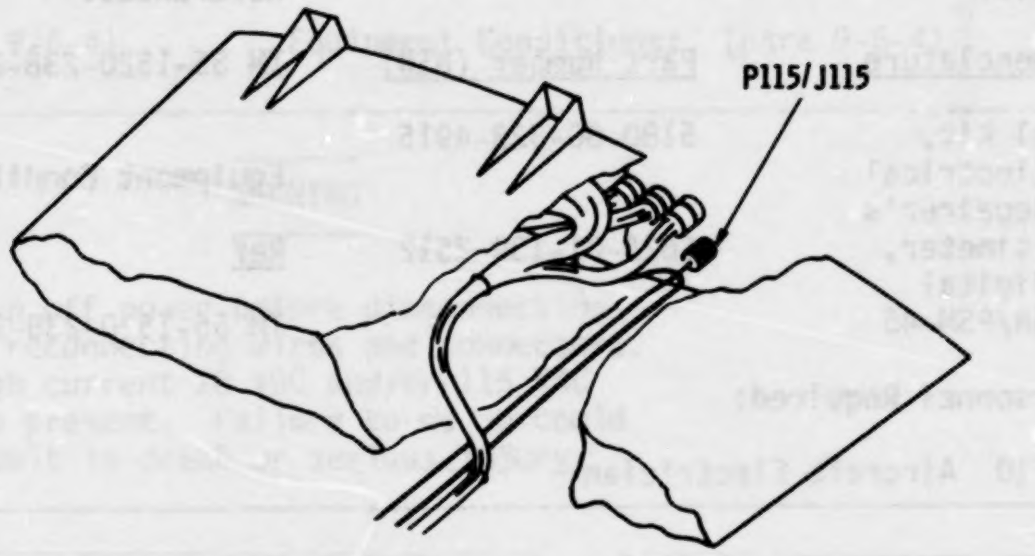
MM04/1-1219-2B

9-6-3. NAVIGATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

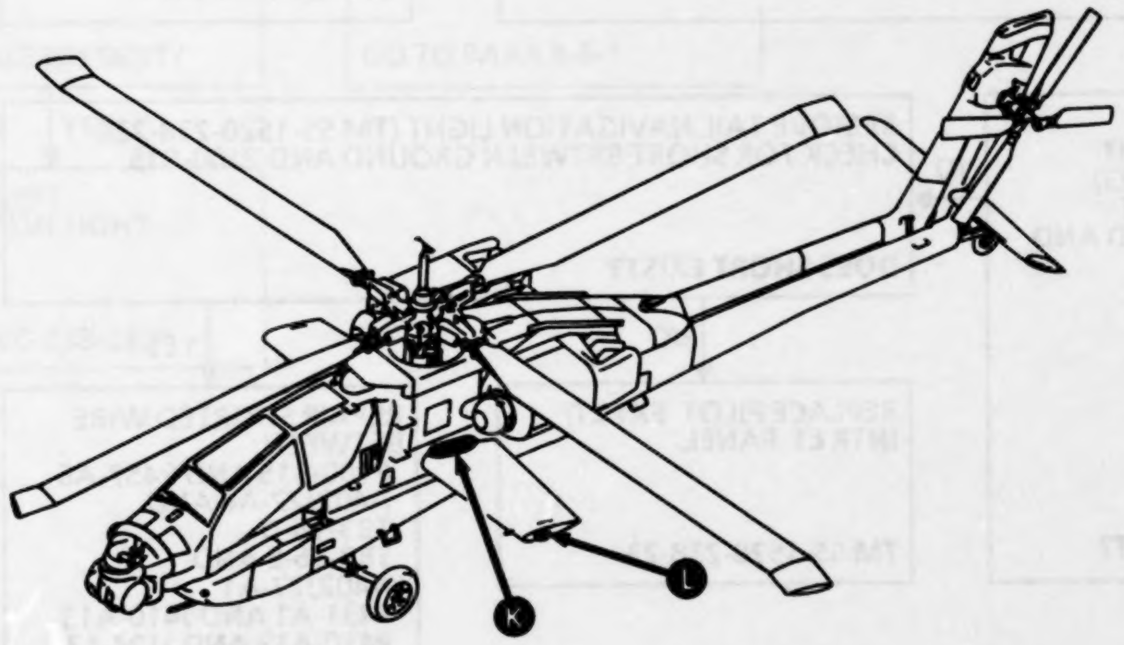

PILOT STATION
M

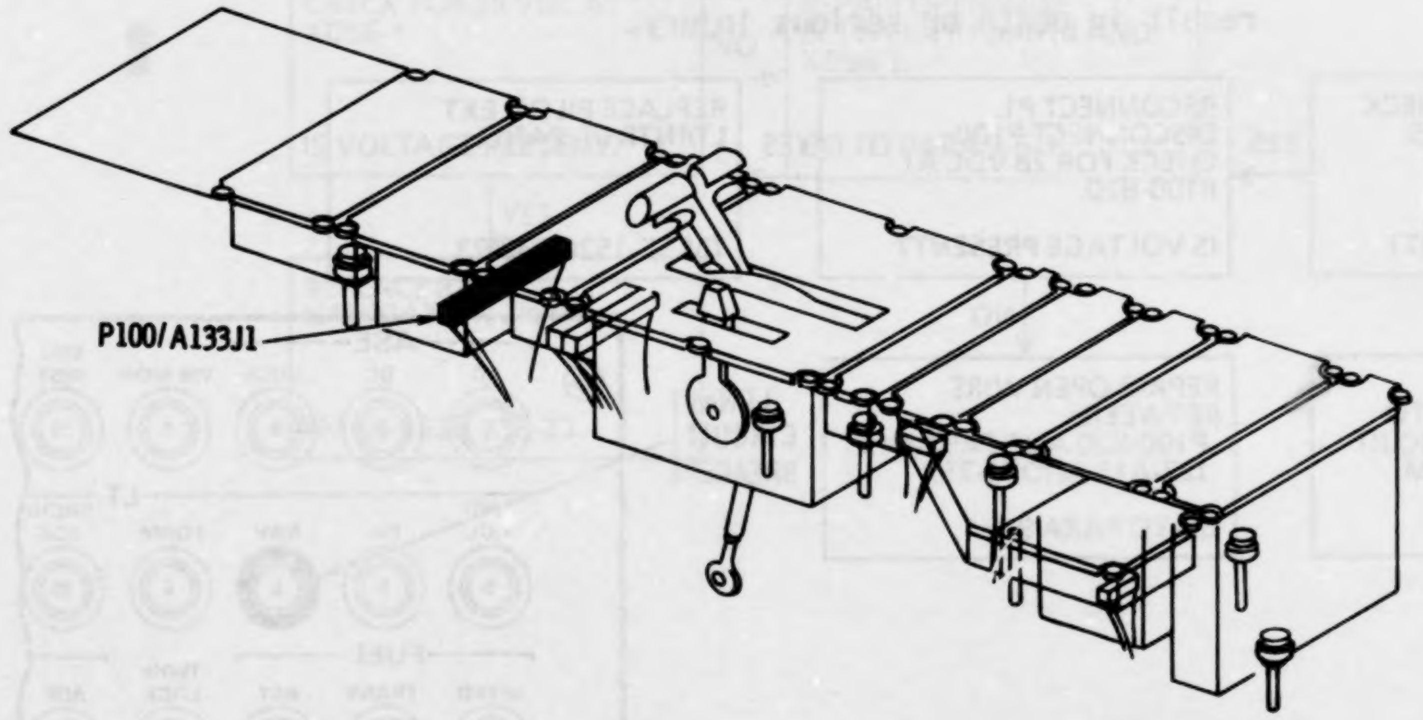


L LEFT WING TIP NAVIGATION LIGHT



K LEFT WING THROUGH FAIRING LW10




P100/A133J1

M PILOT LEFT SIDE CONSOLE

MM04/1-1219-3C

9-6-4. ALL NAVIGATION LIGHTS - DO NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

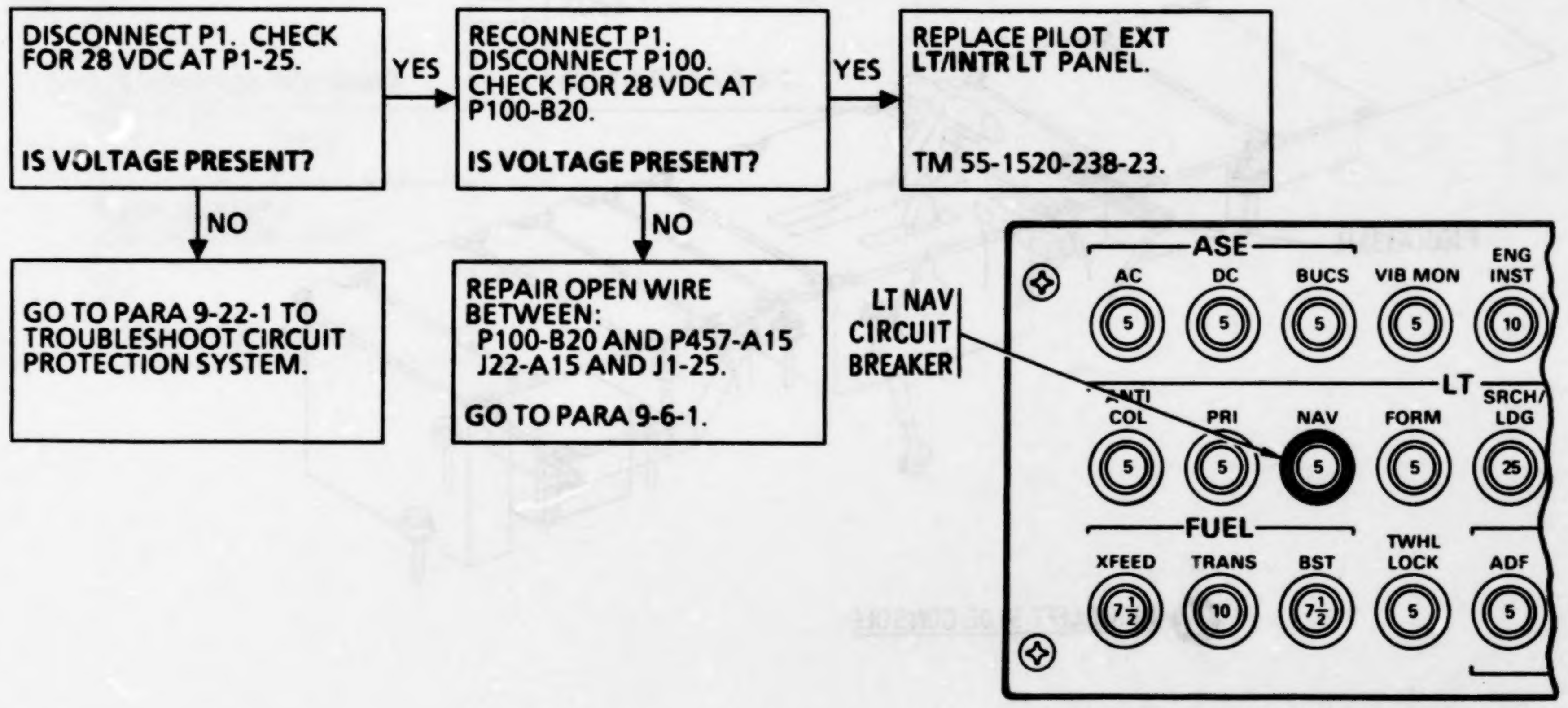
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



DISCONNECT P1. CHECK FOR 28 VDC AT P1-25.
IS VOLTAGE PRESENT?

YES → RECONNECT P1. DISCONNECT P100. CHECK FOR 28 VDC AT P100-B20.
IS VOLTAGE PRESENT?

YES → REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.

NO (P1-25) → GO TO PARA 9-22-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

NO (P100-B20) → REPAIR OPEN WIRE BETWEEN:
P100-B20 AND P457-A15
J22-A15 AND J1-25.
GO TO PARA 9-6-1.

PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1359

END OF TASK

9-6-5. LT NAV CIRCUIT BREAKER (CB73) - DOES NOT STAY CLOSED

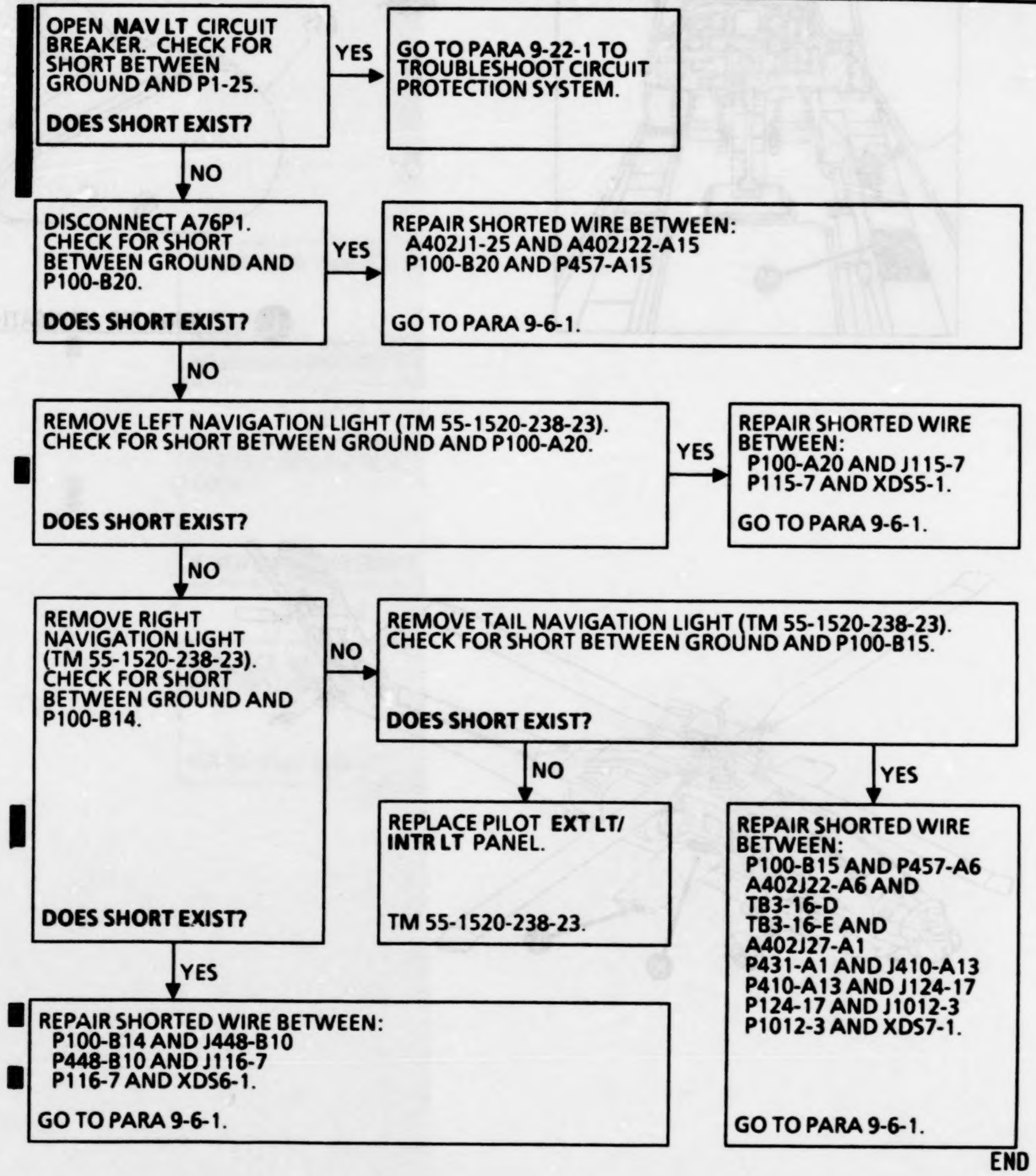
Tools: (para 9-6-4)

Personnel Required: (para 9-6-4)

References: (para 9-6-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



OPEN NAV LT CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND P1-25.
DOES SHORT EXIST?

YES → GO TO PARA 9-22-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

NO → DISCONNECT A76P1. CHECK FOR SHORT BETWEEN GROUND AND P100-B20.
DOES SHORT EXIST?

YES → REPAIR SHORTED WIRE BETWEEN:
A402J1-25 AND A402J22-A15
P100-B20 AND P457-A15
GO TO PARA 9-6-1.

NO → REMOVE LEFT NAVIGATION LIGHT (TM 55-1520-238-23). CHECK FOR SHORT BETWEEN GROUND AND P100-A20.
DOES SHORT EXIST?

YES → REPAIR SHORTED WIRE BETWEEN:
P100-A20 AND J115-7
P115-7 AND XDS5-1.
GO TO PARA 9-6-1.

NO → REMOVE RIGHT NAVIGATION LIGHT (TM 55-1520-238-23). CHECK FOR SHORT BETWEEN GROUND AND P100-B14.
DOES SHORT EXIST?

YES → REPAIR SHORTED WIRE BETWEEN:
P100-B14 AND J448-B10
P448-B10 AND J116-7
P116-7 AND XDS6-1.
GO TO PARA 9-6-1.

NO → REMOVE TAIL NAVIGATION LIGHT (TM 55-1520-238-23). CHECK FOR SHORT BETWEEN GROUND AND P100-B15.
DOES SHORT EXIST?

NO → REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.

YES → REPAIR SHORTED WIRE BETWEEN:
P100-B15 AND P457-A6
A402J22-A6 AND TB3-16-D
TB3-16-E AND A402J27-A1
P431-A1 AND J410-A13
P410-A13 AND J124-17
P124-17 AND J1012-3
P1012-3 AND XDS7-1.
GO TO PARA 9-6-1.

END OF TASK

9-6-6. LEFT NAVIGATION LIGHT - DOES NOT FUNCTION

Tools: (para 9-6-4)

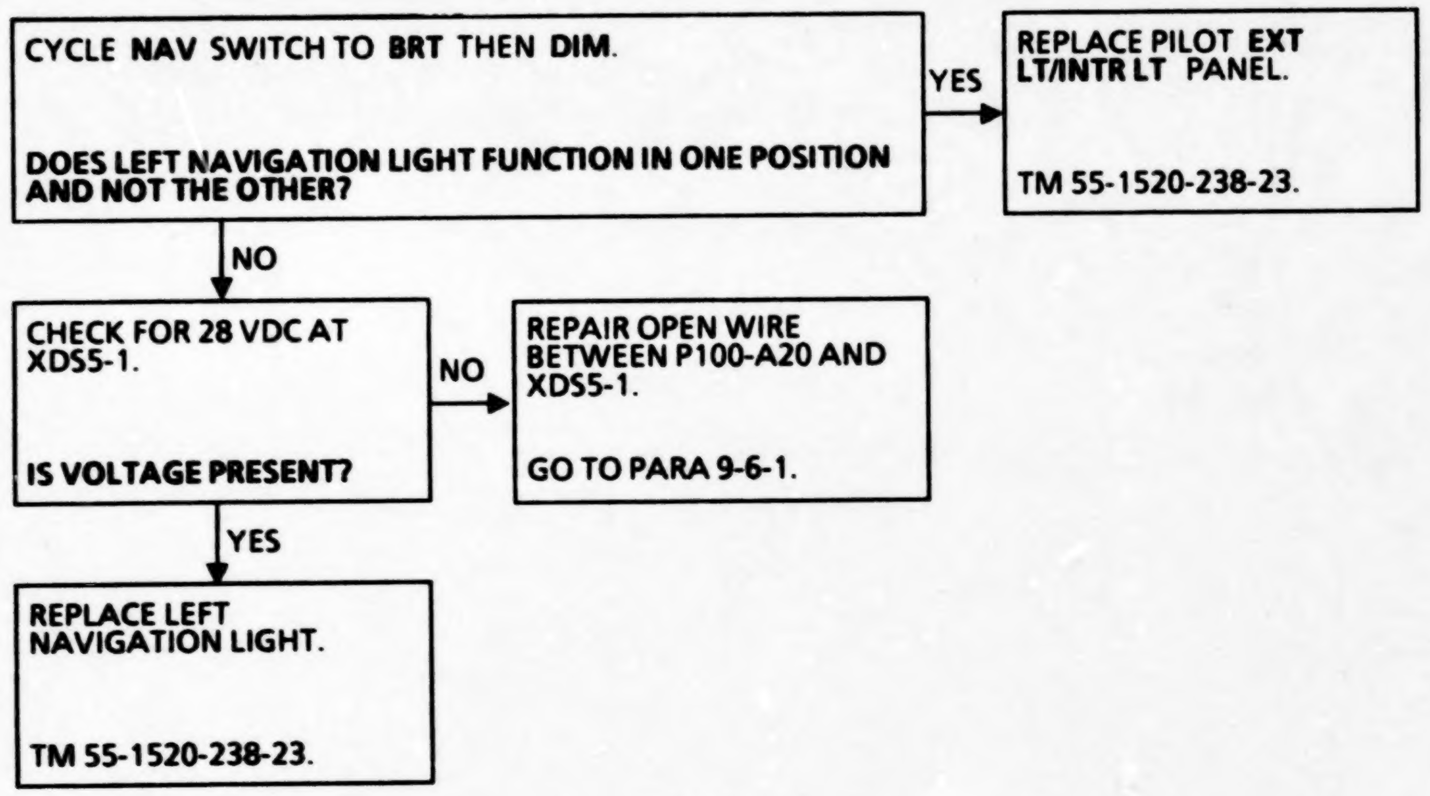
References: (para 9-6-4)

Personnel Required: (para 9-6-4)

Equipment Conditions: (para 9-6-4

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CYCLE NAV SWITCH TO BRT THEN DIM.
DOES LEFT NAVIGATION LIGHT FUNCTION IN ONE POSITION AND NOT THE OTHER?
YES
REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.
NO
CHECK FOR 28 VDC AT XDS5-1.
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN P100-A20 AND XDS5-1.
GO TO PARA 9-6-1.
YES
REPLACE LEFT NAVIGATION LIGHT.
TM 55-1520-238-23.

END OF TASK

9-6-7. RIGHT NAVIGATION LIGHT - DOES NOT FUNCTION

Tools: (para 9-6-4)

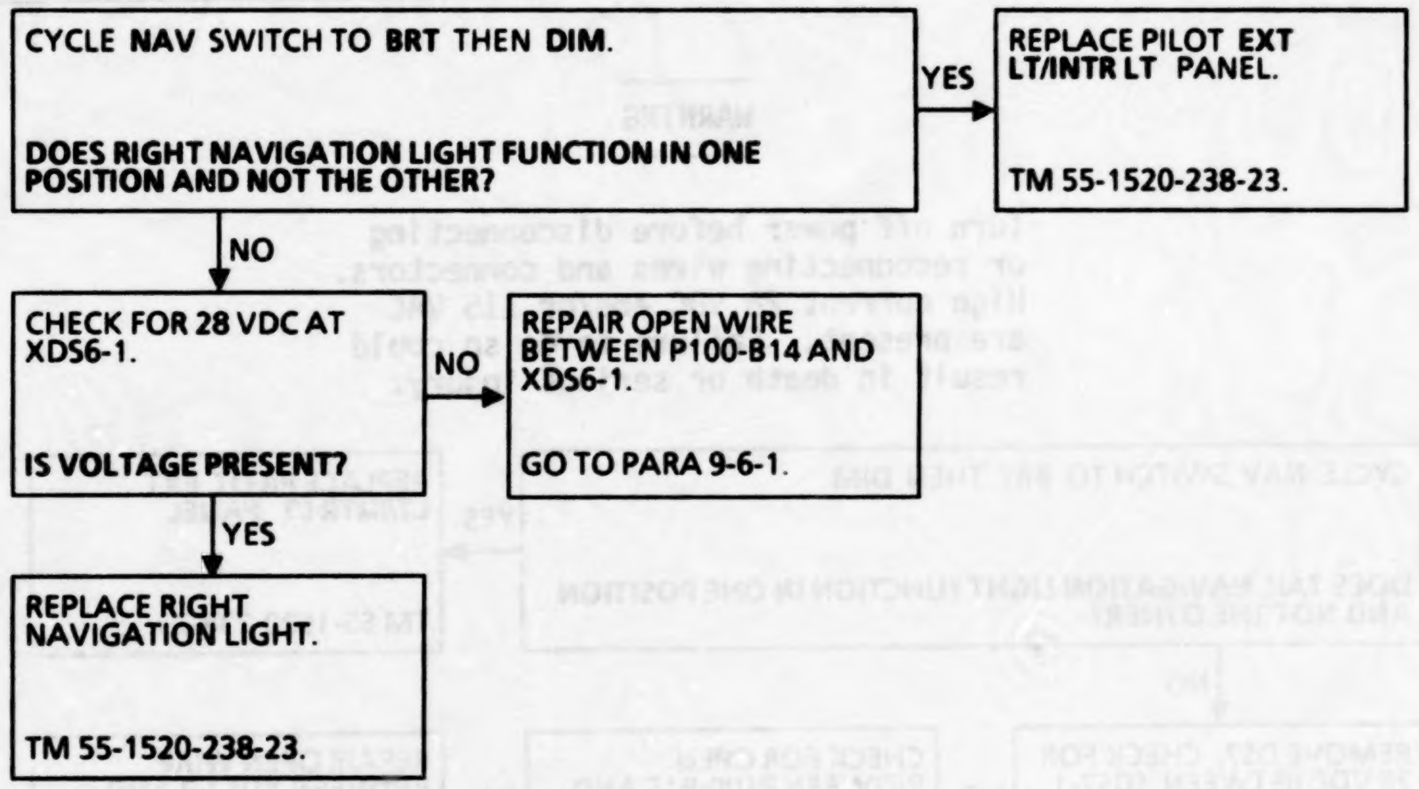
References: (para 9-6-4)

Personnel Required: (para 9-6-4)

Equipment Conditions: (para 9-6-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CYCLE NAV SWITCH TO BRT THEN DIM.
DOES RIGHT NAVIGATION LIGHT FUNCTION IN ONE POSITION AND NOT THE OTHER?
YES
REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.
NO
CHECK FOR 28 VDC AT XDS6-1.
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN P100-B14 AND XDS6-1.
GO TO PARA 9-6-1.
YES
REPLACE RIGHT NAVIGATION LIGHT.
TM 55-1520-238-23.

END OF TASK

9-6-8. TAIL NAVIGATION LIGHT - DOES NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

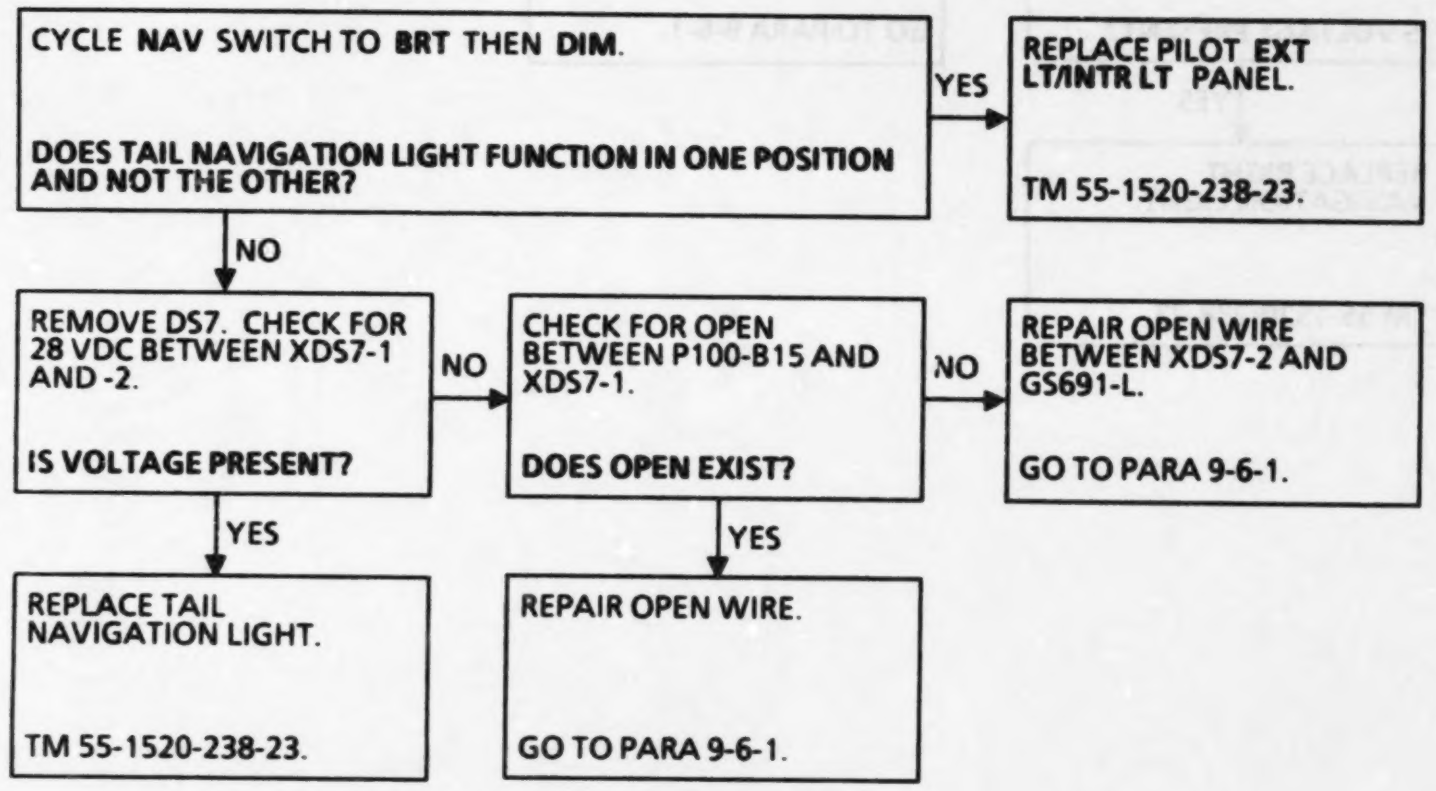
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CYCLE NAV SWITCH TO BRT THEN DIM.
DOES TAIL NAVIGATION LIGHT FUNCTION IN ONE POSITION AND NOT THE OTHER?
YES
REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.
NO
REMOVE DS7. CHECK FOR 28 VDC BETWEEN XDS7-1 AND -2.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN P100-B15 AND XDS7-1.
DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN XDS7-2 AND GS691-L.
GO TO PARA 9-6-1.
YES
REPLACE TAIL NAVIGATION LIGHT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-6-1.

END OF TASK

9-7-1. FORMATION LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

TM 55-1520-238-23

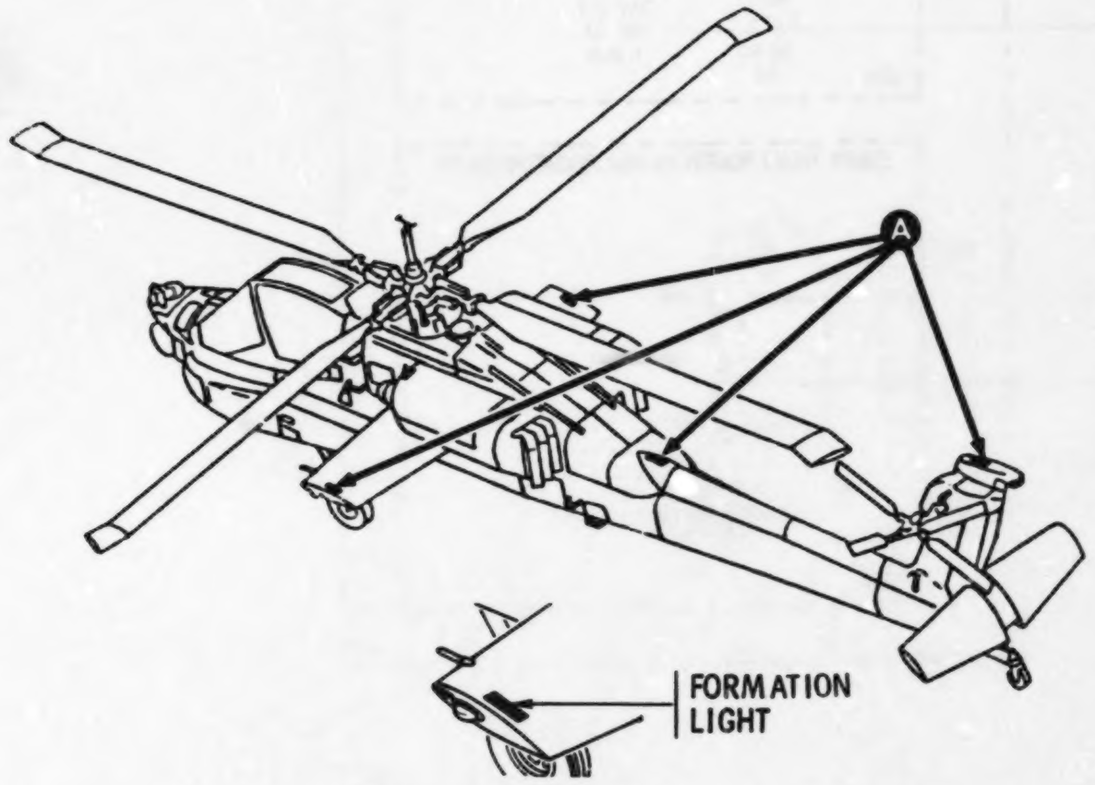
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Formation lights visual inspection performed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

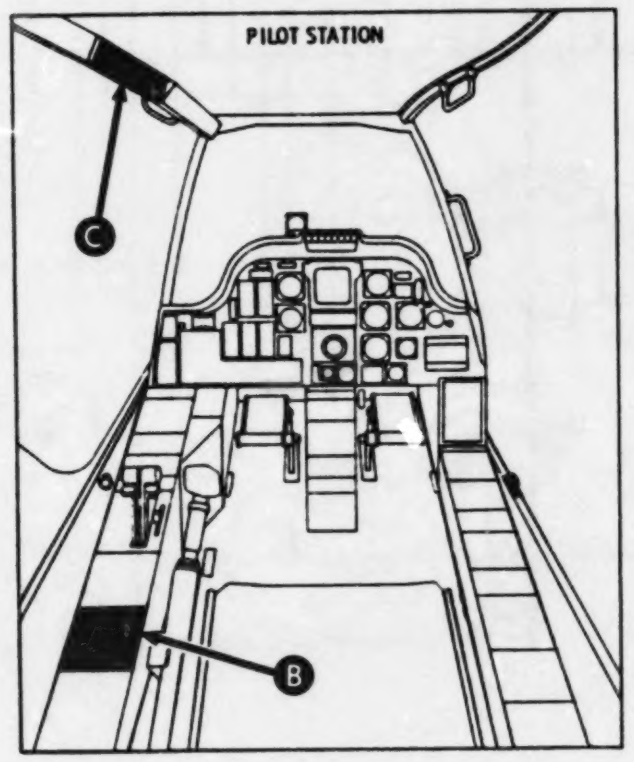
A. Perform operational check as follows:

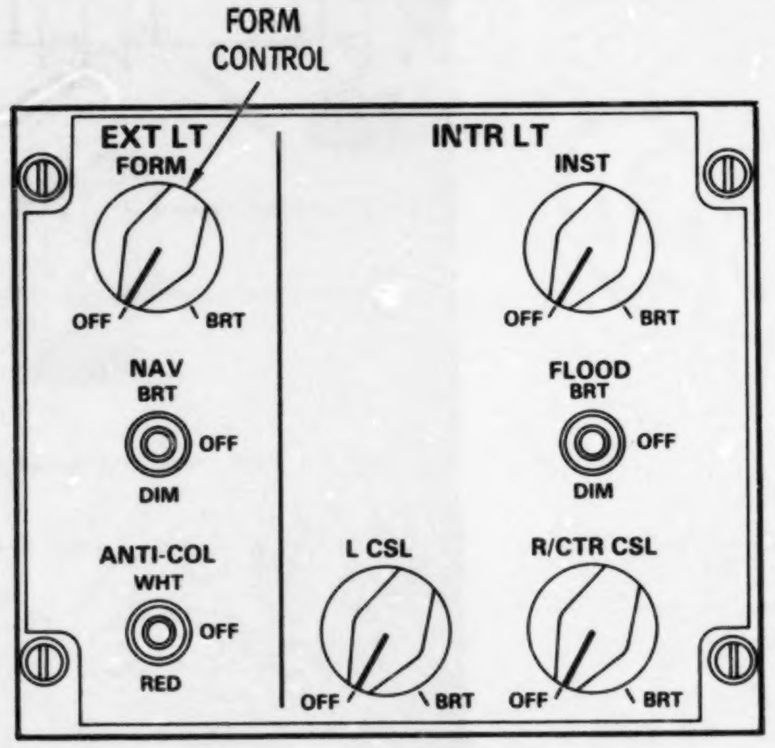
TASK	RESULT
1. On pilot circuit breaker panel, check that **LT FORM** circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-7-4.
2. On **EXT LT/INTR LT** panel, set **FORM** control to **BRT**. Check that all formation lights function.	If left, right, tail, and fuselage formation lights do not function, go to para 9-7-5. If left formation light does not function, go to para 9-7-6. If right formation light does not function, go to para 9-7-7. If tail formation light does not function, go to para 9-7-8. If fuselage formation light does not function, go to para 9-7-9.

B. Perform EXTERNAL POWER - POWER DOWN (para 9-5-3).

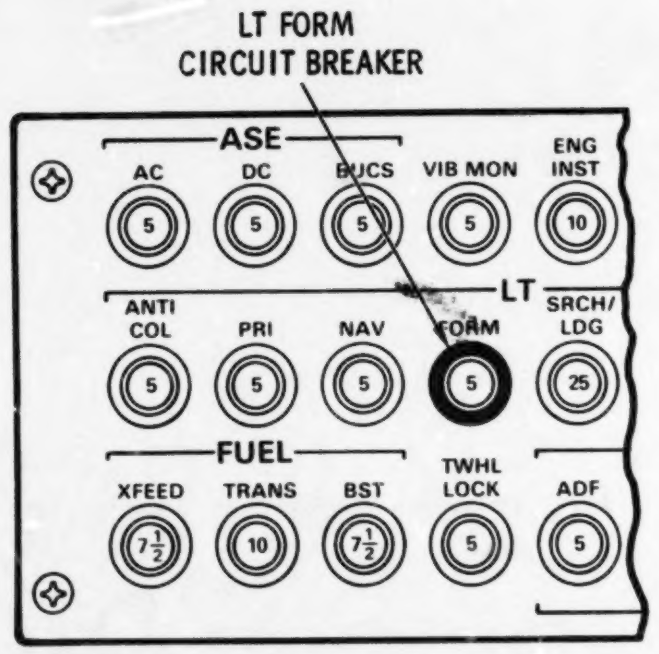

A
FORMATION LIGHT

Ⓐ FORMATION LIGHT (TYPICAL)


PILOT STATION
C
B


FORM CONTROL
EXT LT
FORM
OFF
BRT
NAV
BRT
OFF
DIM
ANTI-COL
WHT
OFF
RED
INTR LT
INST
OFF
BRT
FLOOD
BRT
OFF
DIM
L CSL
OFF
BRT
R/CTR CSL
OFF
BRT

Ⓑ PILOT EXT LT/INTR LT PANEL

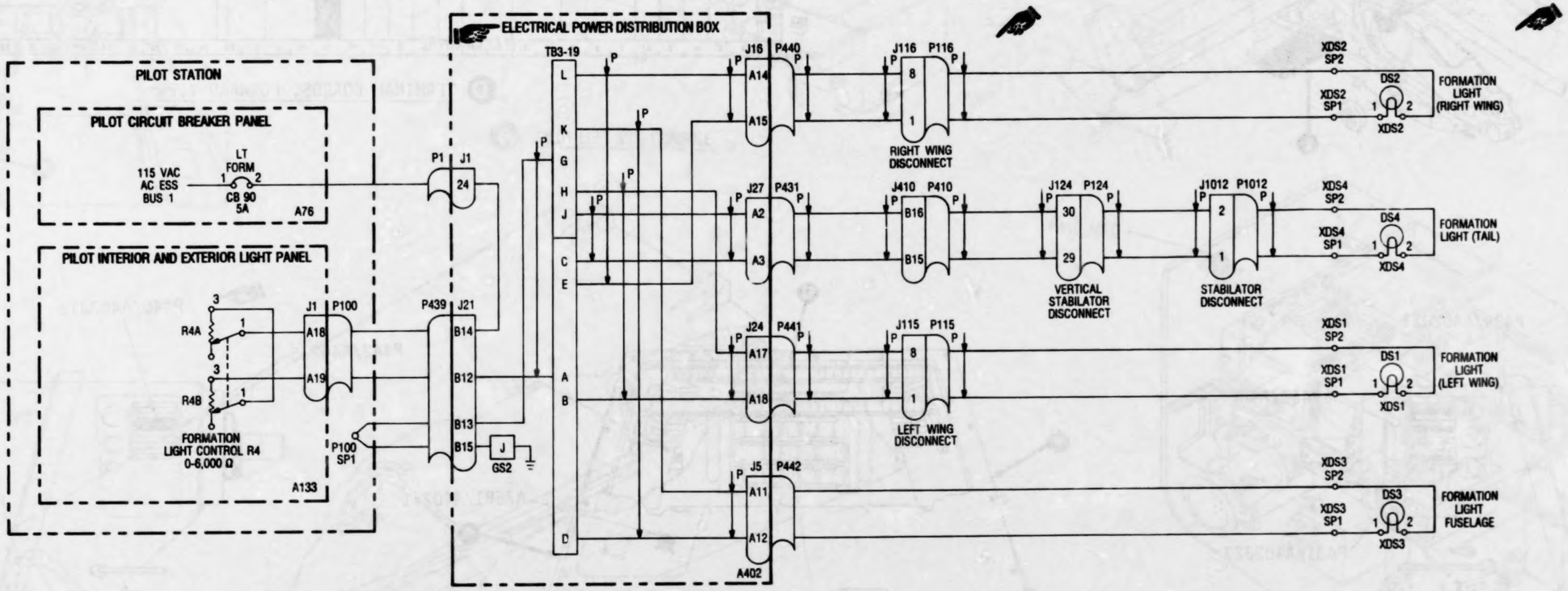

LT FORM CIRCUIT BREAKER
ASE
AC
DC
BUCS
VIB MON
ENG INST
5
5
5
5
10
LT
ANTI COL
PRI
NAV
FORM
SRCH/LDG
5
5
5
5
25
FUEL
XFEED
TRANS
BST
TWHL LOCK
ADF
7½
10
7½
5
5

Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1021B

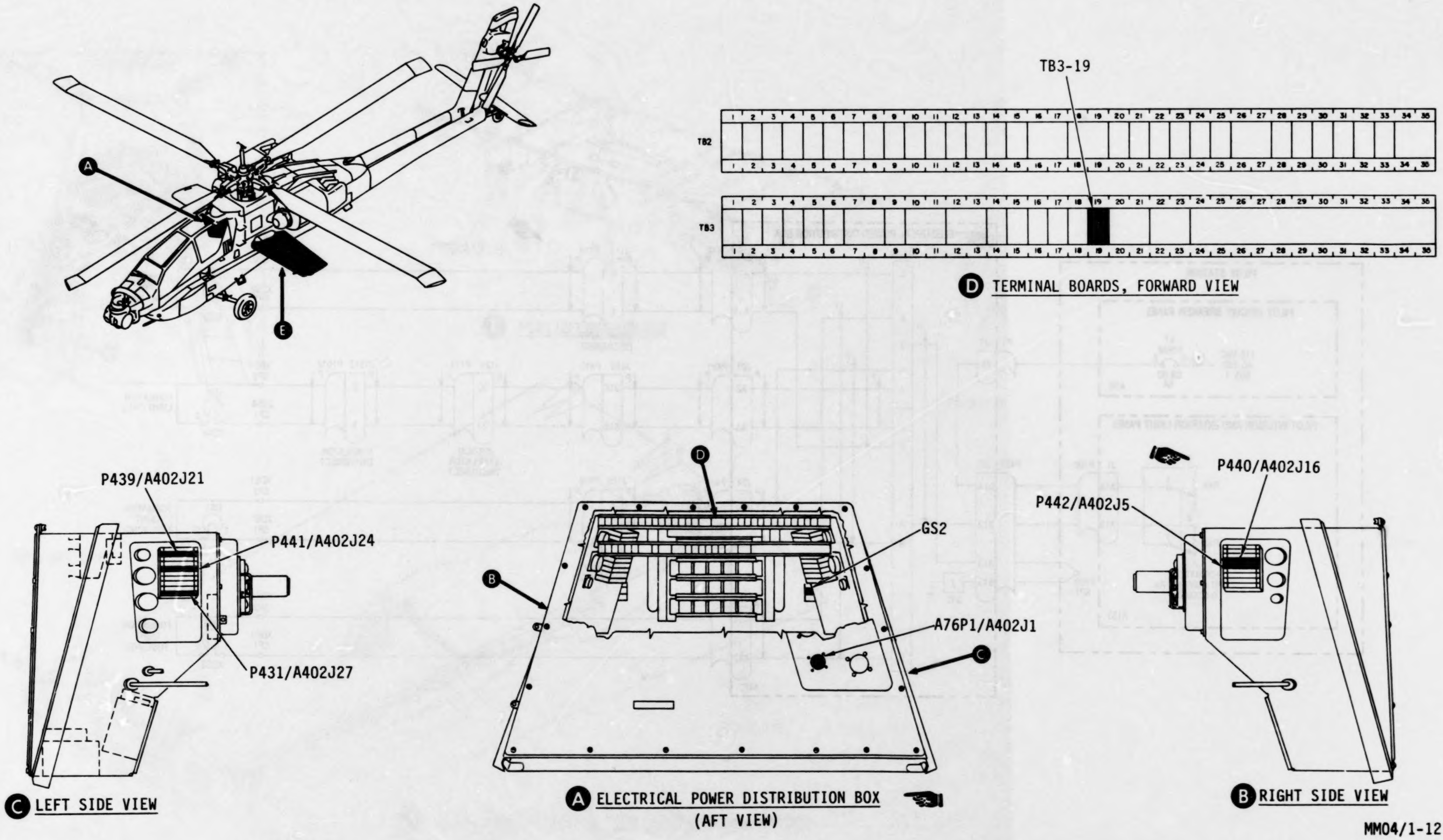
END OF TASK

9-7-2. FORMATION LIGHTS - INTERCONNECTION DIAGRAM


PILOT STATION
PILOT CIRCUIT BREAKER PANEL
115 VAC
AC ESS
BUS 1
LT
FORM
CB 90
5A
A76
PILOT INTERIOR AND EXTERIOR LIGHT PANEL
R4A
R4B
FORMATION
LIGHT CONTROL R4
0-6,000 Ω
J1
P100
A18
A19
P100
SP1
A133
P1
J1
24
P439
J21
B14
B12
B13
B15
J
GS2
ELECTRICAL POWER DISTRIBUTION BOX
TB3-19
L
K
G
H
J
C
E
A
B
D
J16
P440
A14
A15
J27
P431
A2
A3
J24
P441
A17
A18
J5
P442
A11
A12
A402
P
J116
P116
8
1
RIGHT WING
DISCONNECT
J410
P410
B16
B15
J124
P124
30
29
VERTICAL
STABILATOR
DISCONNECT
J1012
P1012
2
1
STABILATOR
DISCONNECT
J115
P115
8
1
LEFT WING
DISCONNECT
XDS2
SP2
XDS2
SP1
DS2
XDS2
FORMATION
LIGHT
(RIGHT WING)
XDS4
SP2
XDS4
SP1
DS4
XDS4
FORMATION
LIGHT (TAIL)
XDS1
SP2
XDS1
SP1
DS1
XDS1
FORMATION
LIGHT
(LEFT WING)
XDS3
SP2
XDS3
SP1
DS3
XDS3
FORMATION
LIGHT
FUSELAGE

MM04/1-727B

9-7-3. FORMATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
E
TB3-19
TB2
TB3
D
P439/A402J21
P441/A402J24
P431/A402J27
B
GS2
A76P1/A402J1
C
P440/A402J16
P442/A402J5
MM04/1-1211-1B

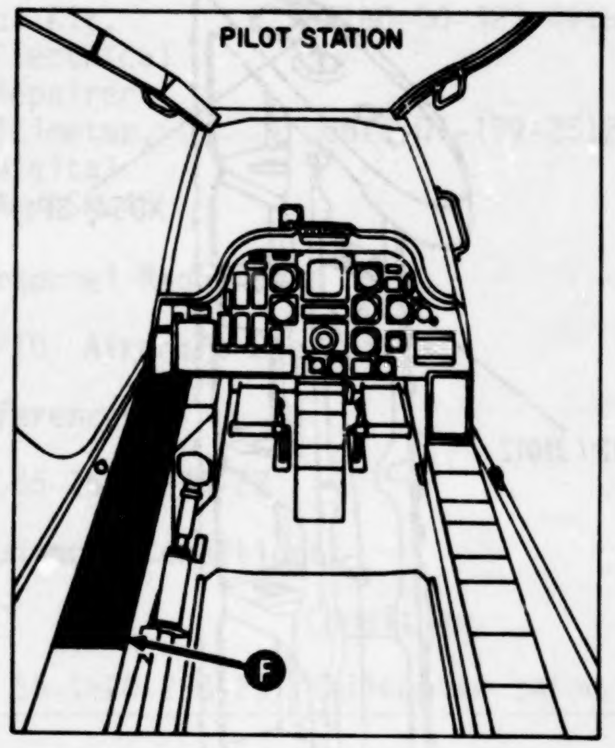
D TERMINAL BOARDS, FORWARD VIEW

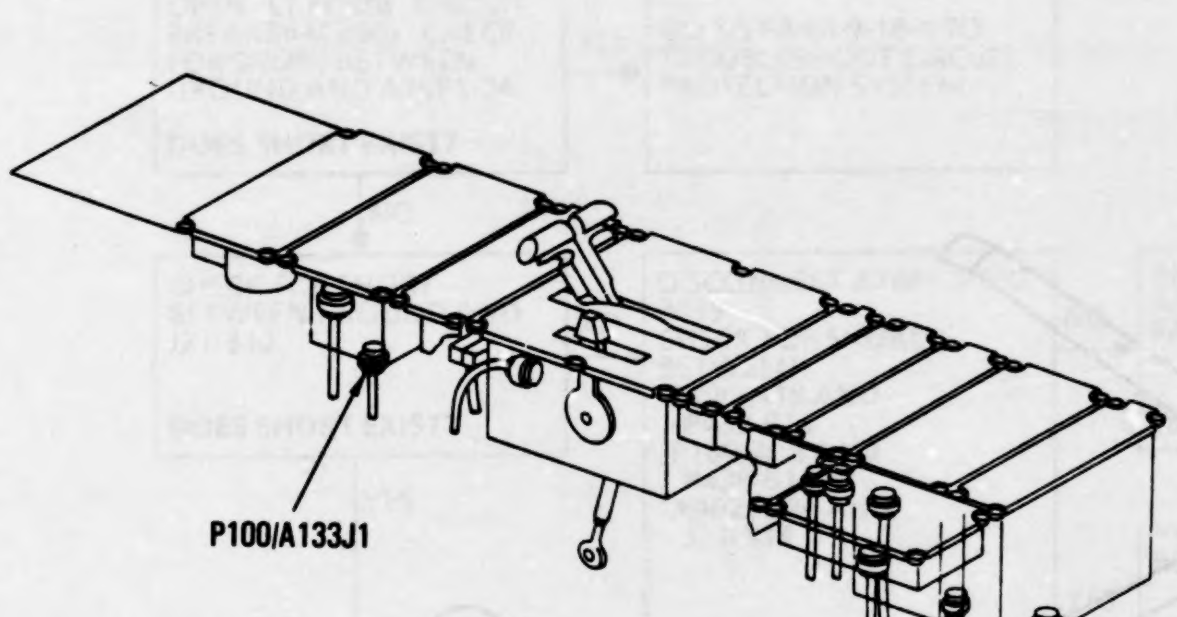
C LEFT SIDE VIEW

A ELECTRICAL POWER DISTRIBUTION BOX
(AFT VIEW)

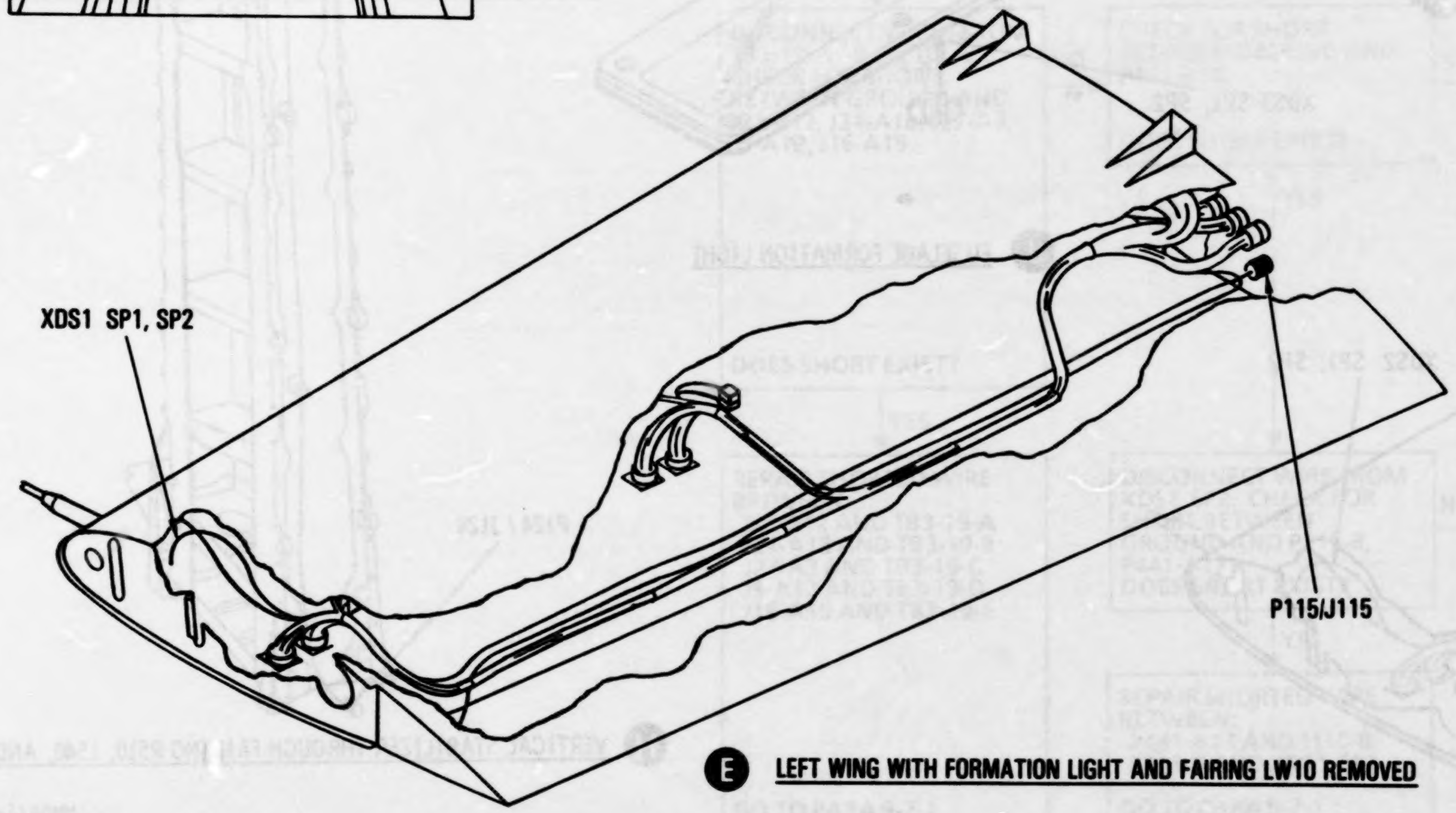
B RIGHT SIDE VIEW

9-7-3. FORMATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

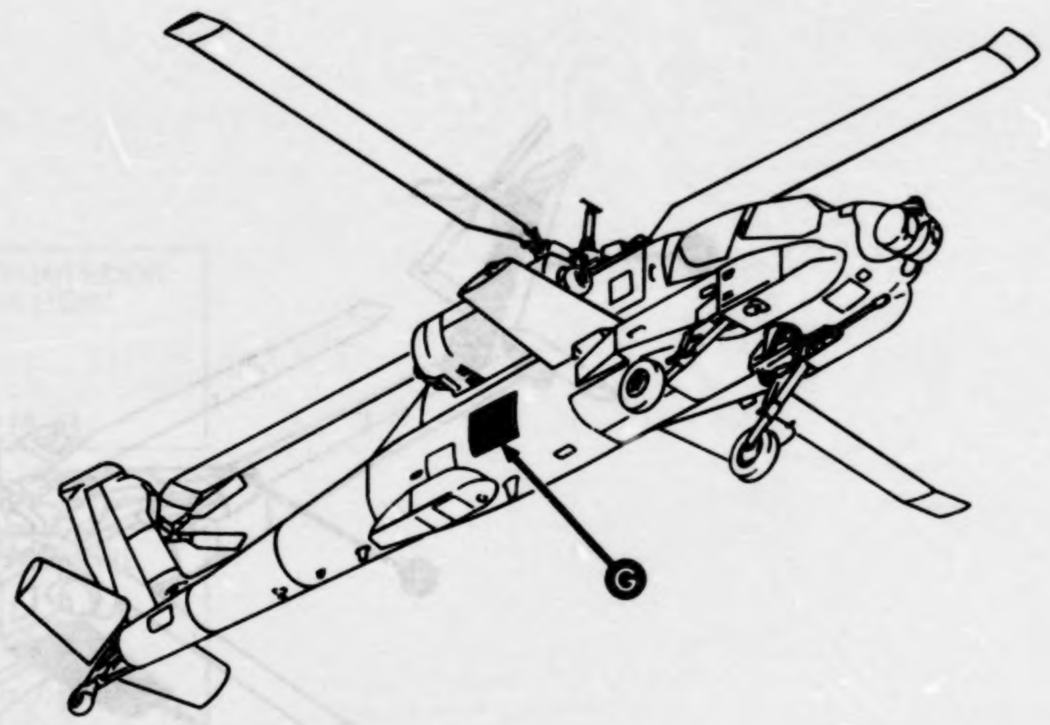

PILOT STATION
F

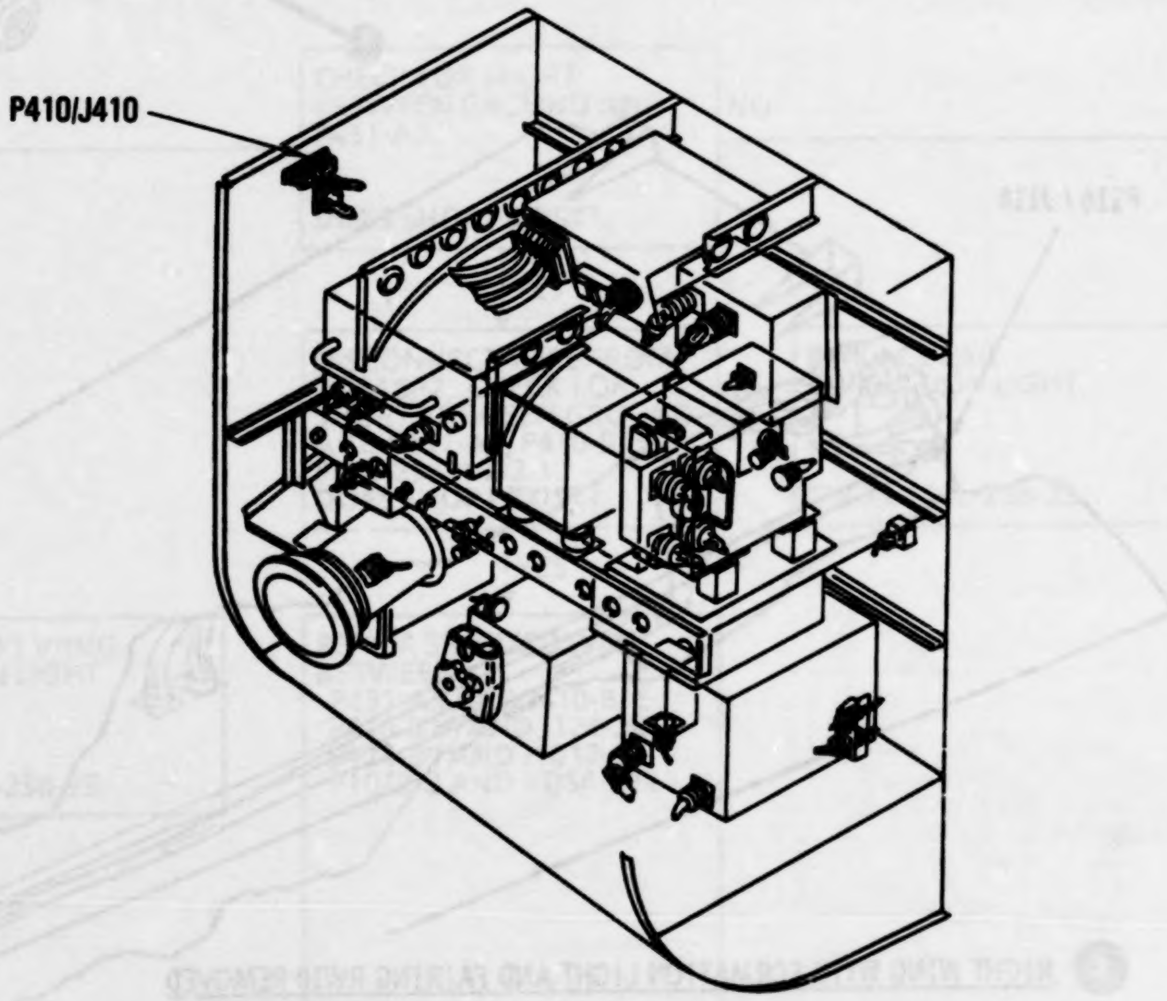

P100/A133J1

F PILOT LEFT SIDE CONSOLE


XDS1 SP1, SP2
P115/J115

E LEFT WING WITH FORMATION LIGHT AND FAIRING LW10 REMOVED

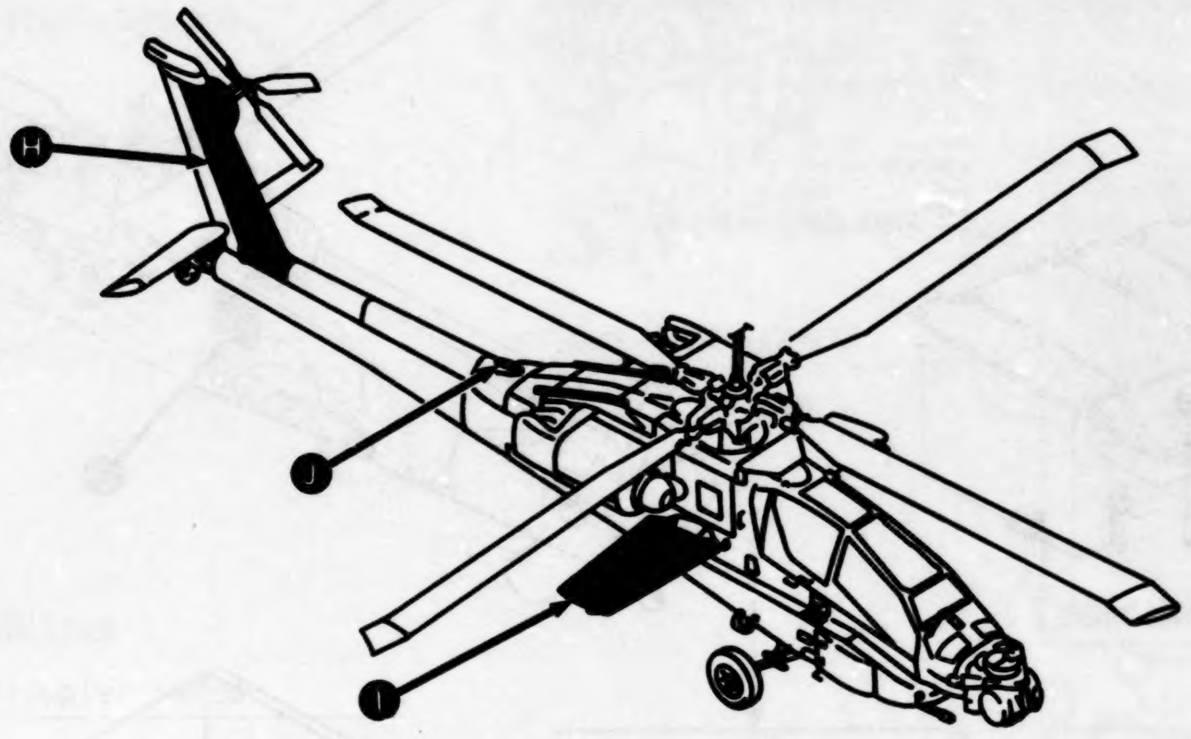


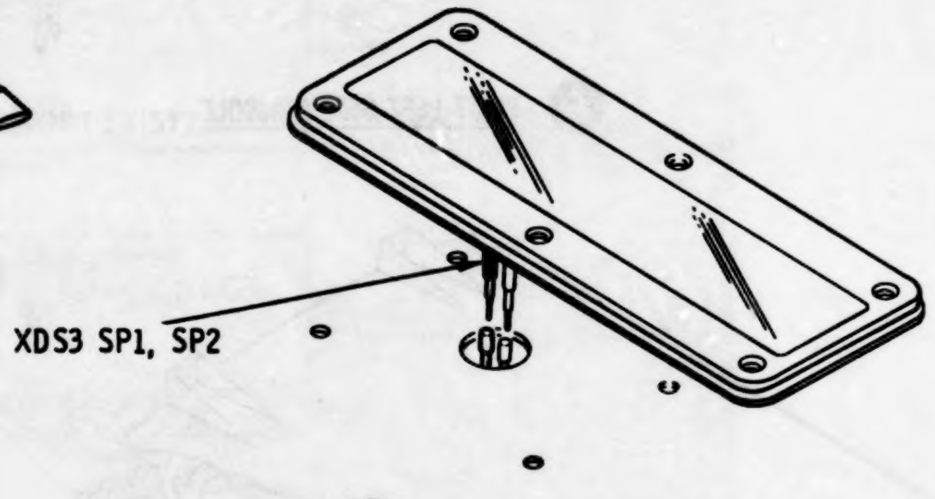


G AFT AVIONICS BAY THROUGH DOOR R295

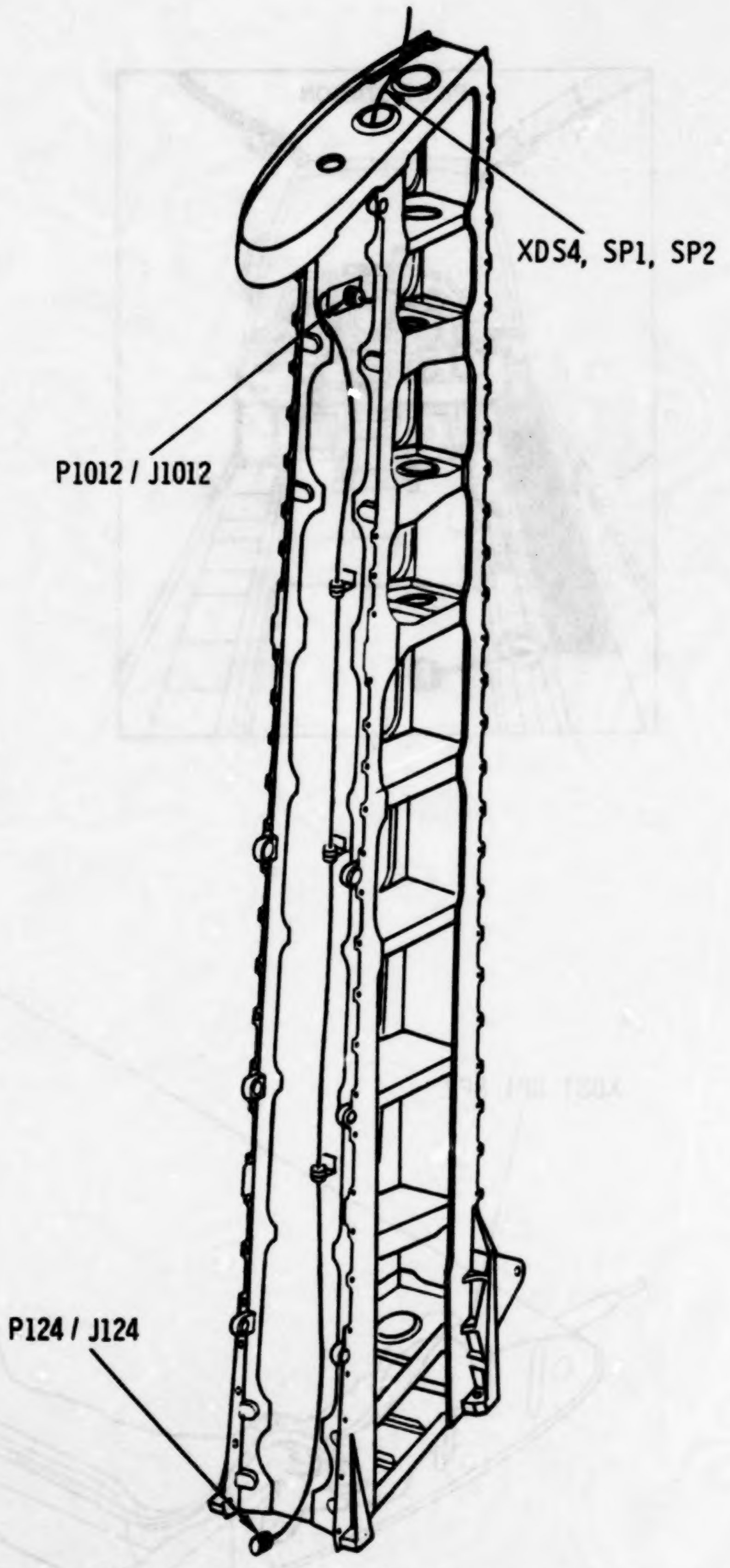
MM04/1-1211-2B

9-7-3. FORMATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

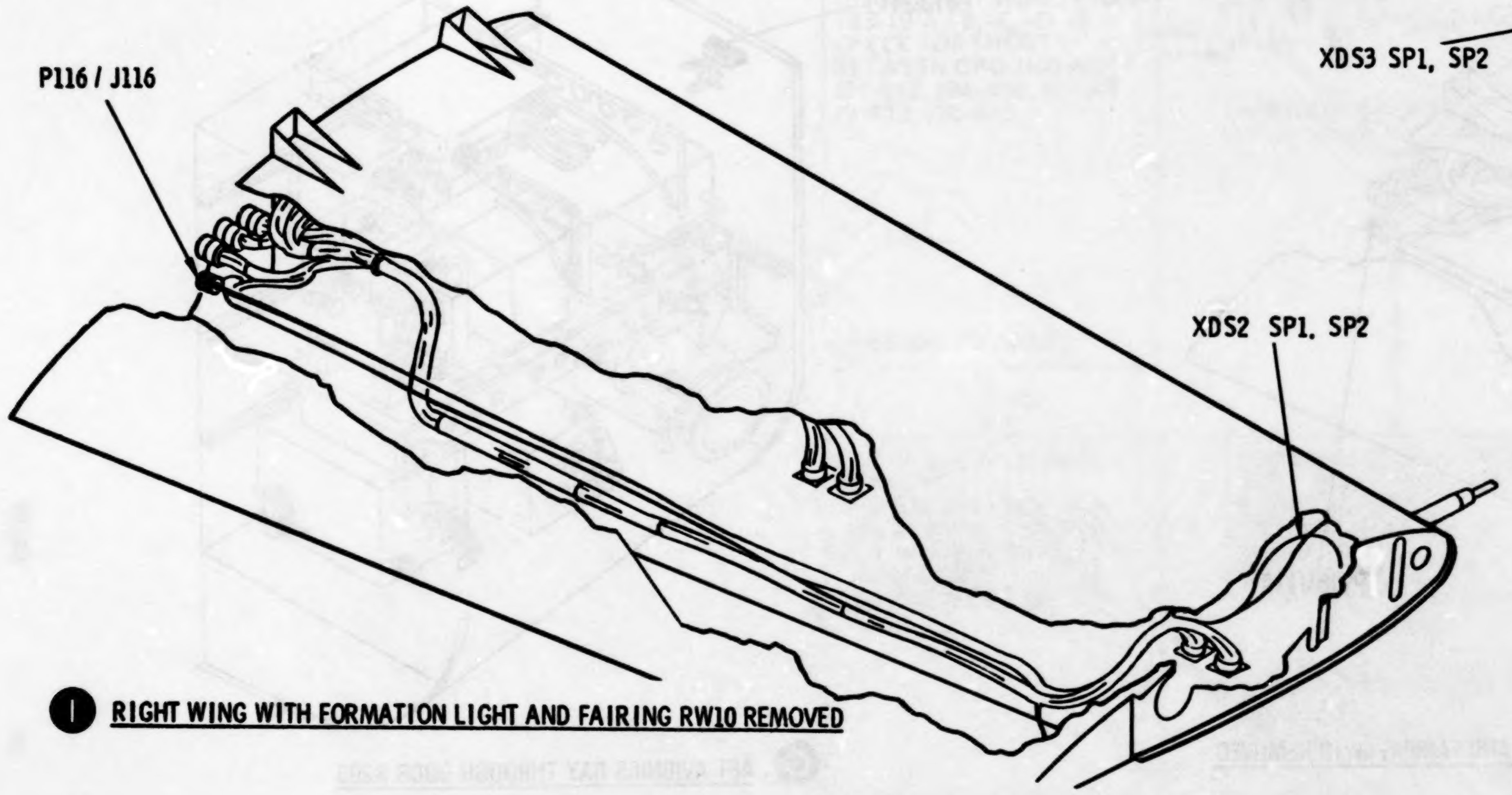



XDS3 SP1, SP2

J FUSELAGE FORMATION LIGHT


XDS4, SP1, SP2
P1012 / J1012
P124 / J124

H VERTICAL STABILIZER THROUGH FAIRING R510, L540, AND T545


P116 / J116
XDS2 SP1, SP2

I RIGHT WING WITH FORMATION LIGHT AND FAIRING RW10 REMOVED

MM04/1-1211-3

9-7-4. LT FORM CIRCUIT BREAKER (CB90) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

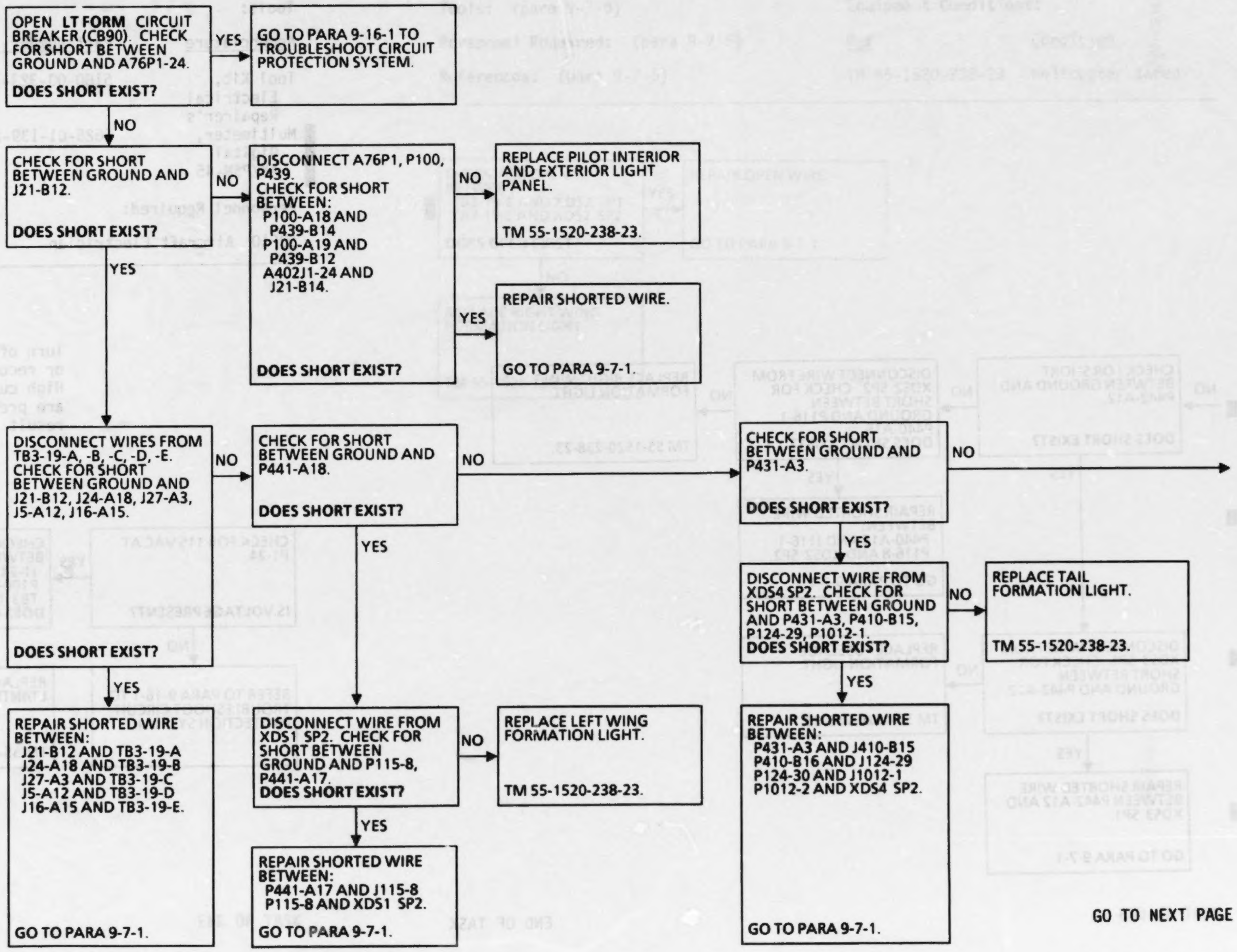
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

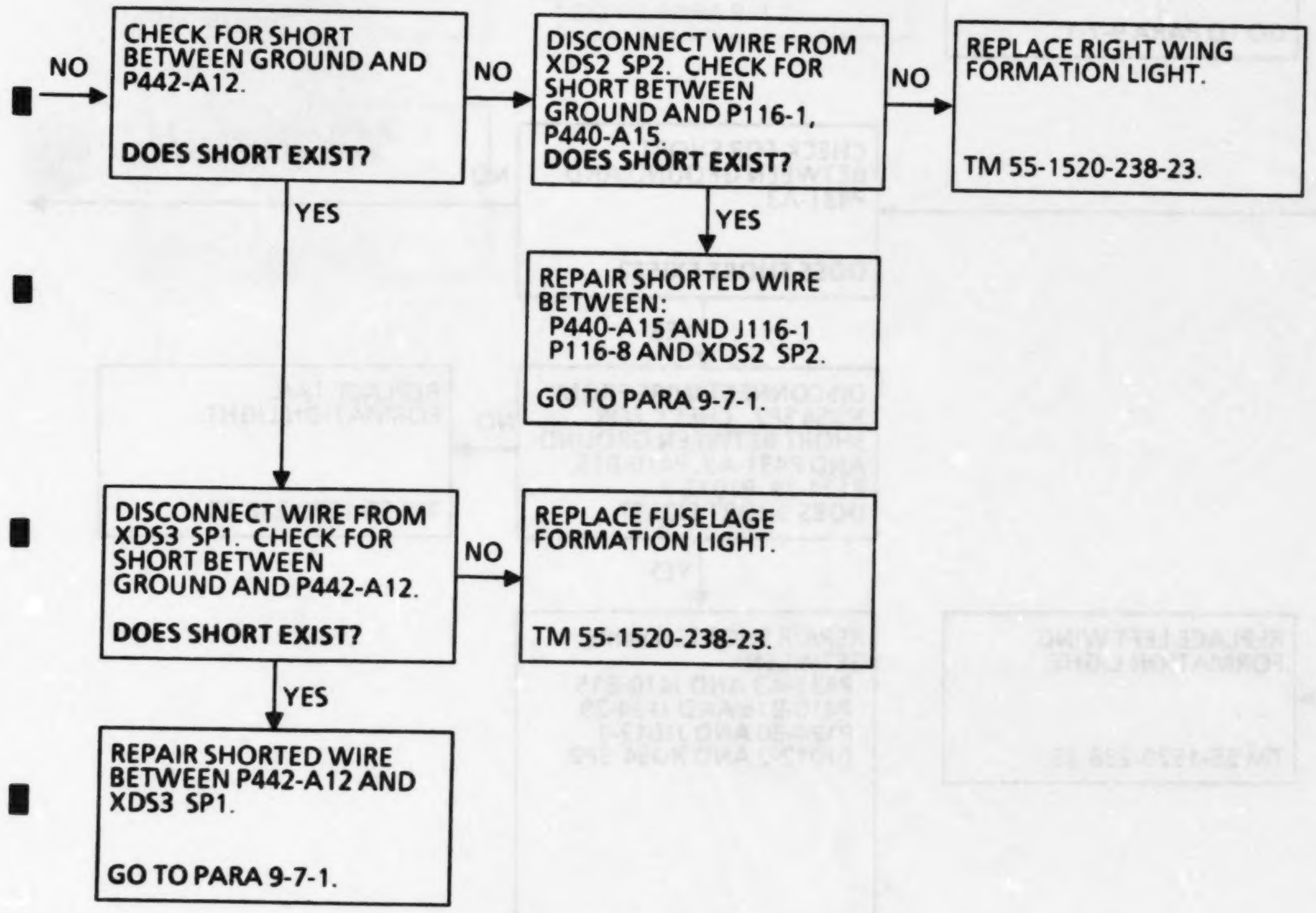
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN LT FORM CIRCUIT BREAKER (CB90). CHECK FOR SHORT BETWEEN GROUND AND A76P1-24.
DOES SHORT EXIST?
YES
GO TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
CHECK FOR SHORT BETWEEN GROUND AND J21-B12.
DOES SHORT EXIST?
NO
DISCONNECT A76P1, P100, P439. CHECK FOR SHORT BETWEEN: P100-A18 AND P439-B14 P100-A19 AND P439-B12 A402J1-24 AND J21-B14.
DOES SHORT EXIST?
NO
REPLACE PILOT INTERIOR AND EXTERIOR LIGHT PANEL.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-7-1.
YES
DISCONNECT WIRES FROM TB3-19-A, -B, -C, -D, -E. CHECK FOR SHORT BETWEEN GROUND AND J21-B12, J24-A18, J27-A3, J5-A12, J16-A15.
DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN GROUND AND P441-A18.
DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN GROUND AND P431-A3.
DOES SHORT EXIST?
NO
YES
REPAIR SHORTED WIRE BETWEEN: J21-B12 AND TB3-19-A J24-A18 AND TB3-19-B J27-A3 AND TB3-19-C J5-A12 AND TB3-19-D J16-A15 AND TB3-19-E.
GO TO PARA 9-7-1.
YES
DISCONNECT WIRE FROM XDS1 SP2. CHECK FOR SHORT BETWEEN GROUND AND P115-8, P441-A17.
DOES SHORT EXIST?
NO
REPLACE LEFT WING FORMATION LIGHT.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN: P441-A17 AND J115-8 P115-8 AND XDS1 SP2.
GO TO PARA 9-7-1.
YES
DISCONNECT WIRE FROM XDS4 SP2. CHECK FOR SHORT BETWEEN GROUND AND P431-A3, P410-B15, P124-29, P1012-1.
DOES SHORT EXIST?
NO
REPLACE TAIL FORMATION LIGHT.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN: P431-A3 AND J410-B15 P410-B16 AND J124-29 P124-30 AND J1012-1 P1012-2 AND XDS4 SP2.
GO TO PARA 9-7-1.

GO TO NEXT PAGE

9-7-4. LT FORM CIRCUIT BREAKER (CB90) - DOES NOT STAY CLOSED (cont)


NO
CHECK FOR SHORT BETWEEN GROUND AND P442-A12.
DOES SHORT EXIST?
NO
DISCONNECT WIRE FROM XDS2 SP2. CHECK FOR SHORT BETWEEN GROUND AND P116-1, P440-A15.
DOES SHORT EXIST?
NO
REPLACE RIGHT WING FORMATION LIGHT.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN:
P440-A15 AND J116-1
P116-8 AND XDS2 SP2.
GO TO PARA 9-7-1.
YES
DISCONNECT WIRE FROM XDS3 SP1. CHECK FOR SHORT BETWEEN GROUND AND P442-A12.
DOES SHORT EXIST?
NO
REPLACE FUSELAGE FORMATION LIGHT.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN P442-A12 AND XDS3 SP1.
GO TO PARA 9-7-1.

END OF TASK

9-7-5. ALL FORMATION LIGHTS - DO NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

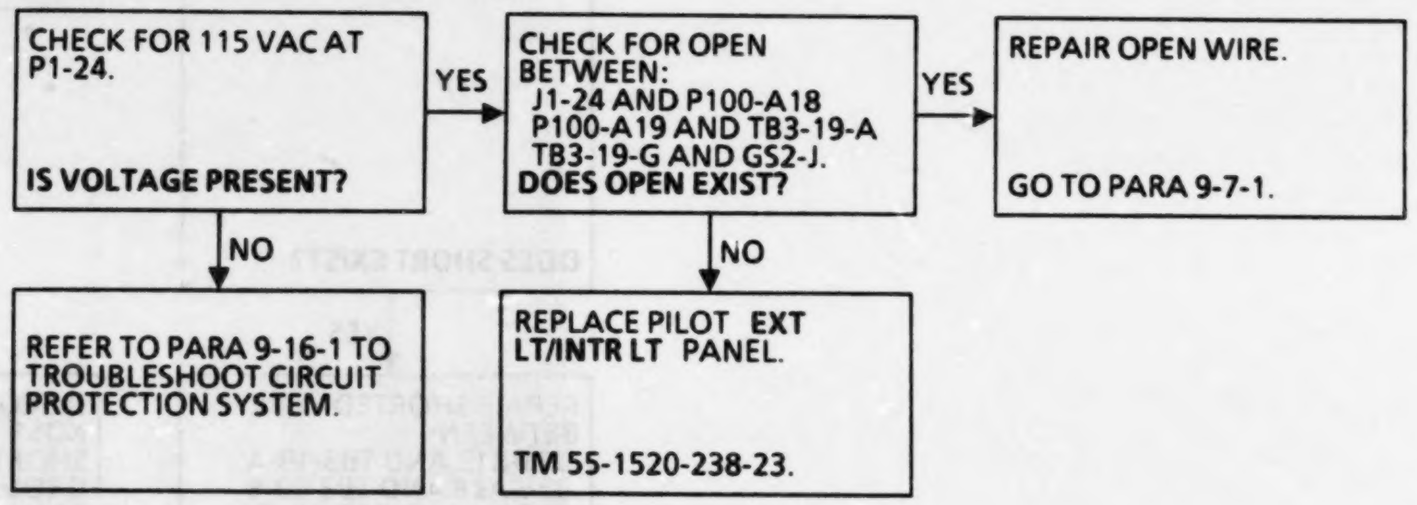
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 115 VAC AT P1-24.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
J1-24 AND P100-A18
P100-A19 AND TB3-19-A
TB3-19-G AND GS2-J.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-7-1.
NO
REFER TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.

END OF TASK

9-7-6. LEFT WING FORMATION LIGHT - DOES NOT FUNCTION

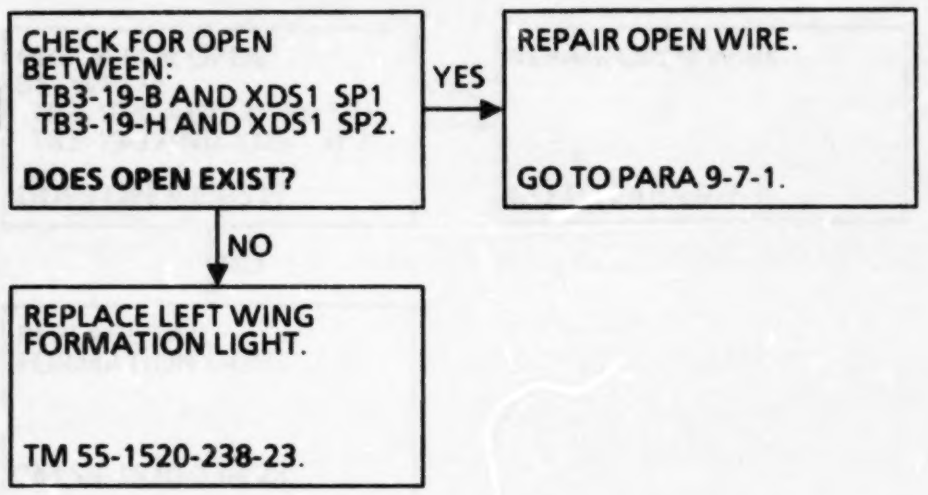
Tools: (para 9-7-5)

Personnel Required: (para 9-7-5)

References: (para 9-7-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CHECK FOR OPEN BETWEEN:
TB3-19-B AND XDS1 SP1
TB3-19-H AND XDS1 SP2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-7-1.
NO
REPLACE LEFT WING FORMATION LIGHT.
TM 55-1520-238-23.

END OF TASK

9-7-7. RIGHT WING FORMATION LIGHT - DOES NOT FUNCTION

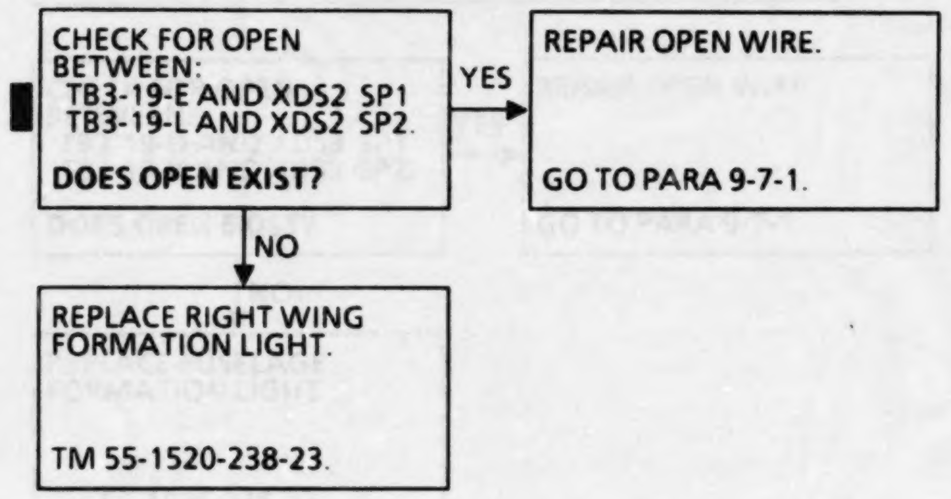
Tools: (para 9-7-5)

Personnel Required: (para 9-7-5)

References: (para 9-7-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CHECK FOR OPEN BETWEEN:
TB3-19-E AND XDS2 SP1
TB3-19-L AND XDS2 SP2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-7-1.
NO
REPLACE RIGHT WING FORMATION LIGHT.
TM 55-1520-238-23.

END OF TASK

9-7-8. TAIL FORMATION LIGHT - DOES NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

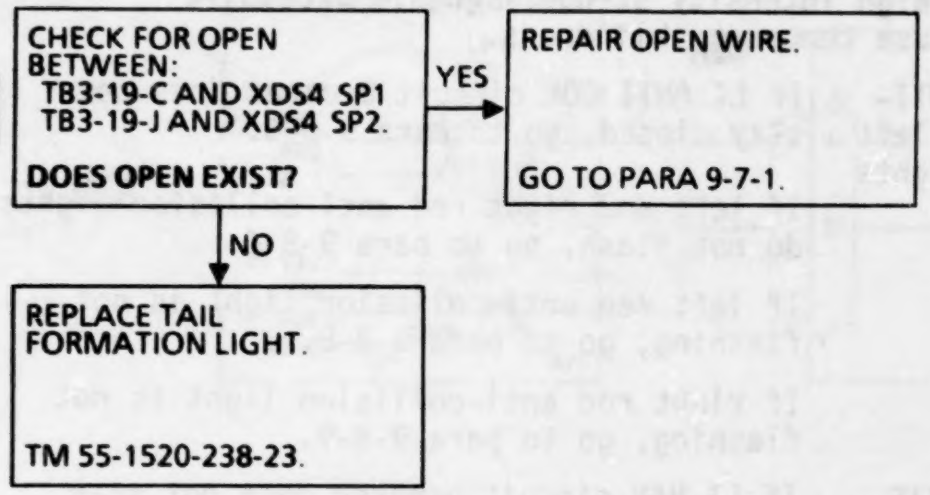
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CHECK FOR OPEN BETWEEN:
TB3-19-C AND XDS4 SP1
TB3-19-J AND XDS4 SP2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-7-1.
NO
REPLACE TAIL FORMATION LIGHT.
TM 55-1520-238-23.

END OF TASK

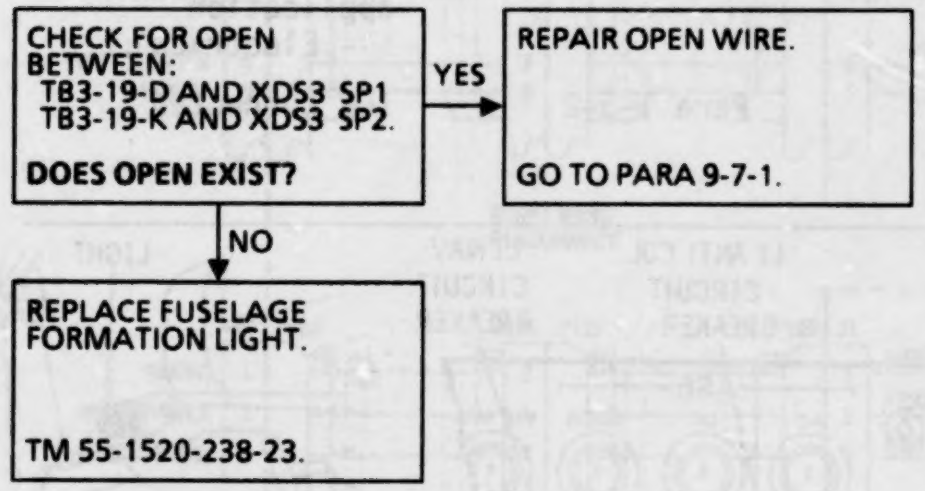
9-7-9. FUSELAGE FORMATION LIGHT - DOES NOT FUNCTION

Tools: (para 9-7-8)

Personnel Required: (para 9-7-8)

References: (para 9-7-8)

Equipment Conditions: (para 9-7-8)


CHECK FOR OPEN BETWEEN:
TB3-19-D AND XDS3 SP1
TB3-19-K AND XDS3 SP2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-7-1.
NO
REPLACE FUSELAGE FORMATION LIGHT.
TM 55-1520-238-23.

END OF TASK

9-8-1. ANTI-COLLISION LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

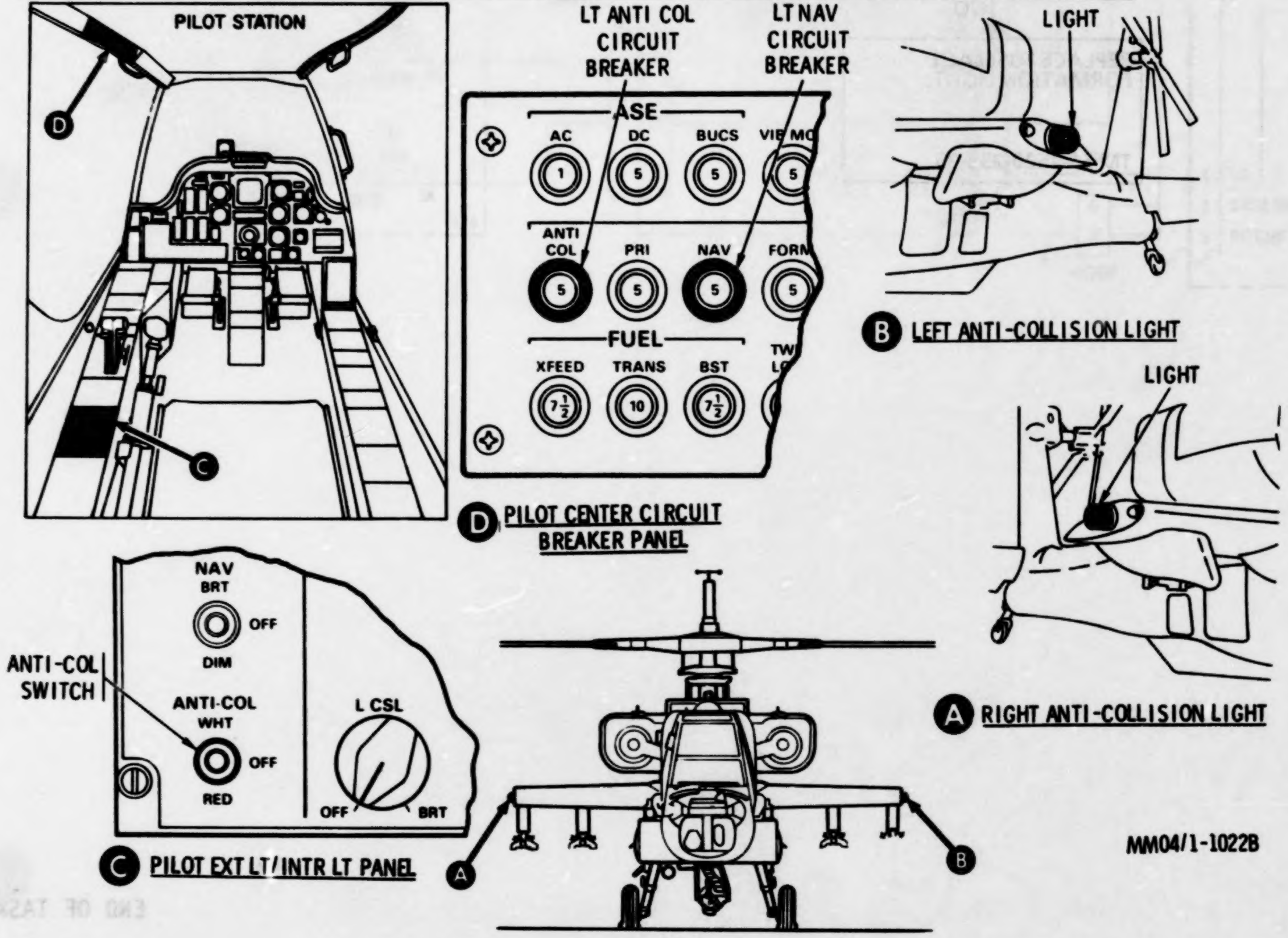
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Anti-collision lights visual inspection performed
	External power application - Electrical
Para 1-3-2	ICS connected


PILOT STATION
LT ANTI COL CIRCUIT BREAKER
LT NAV CIRCUIT BREAKER
ASE
AC
1
DC
5
BUCS
5
VIB MO
5
ANTI COL
5
PRI
5
NAV
5
FORM
5
FUEL
XFEED
7½
TRANS
10
BST
7½
TW
LIGHT
B LEFT ANTI-COLLISION LIGHT
LIGHT
A RIGHT ANTI-COLLISION LIGHT
D PILOT CENTER CIRCUIT BREAKER PANEL
NAV
BRT
OFF
DIM
ANTI-COL SWITCH
ANTI-COL
WHT
OFF
RED
L CSL
OFF
BRT
C PILOT EXT LT/INTR LT PANEL
A
B
C
D

MM04/1-1022B

A. Perform operational check as follows:

TASK	RESULT
1. On pilot center circuit breaker panel, check that LT NAV and LT ANTI COL circuit breakers are closed.	If LT NAV circuit breaker (CB73) does not stay closed, go to para 9-6-1 to troubleshoot navigation lights. If LT ANTI COL circuit breaker (CB40) does not stay closed, go to para 9-8-6.

WARNING

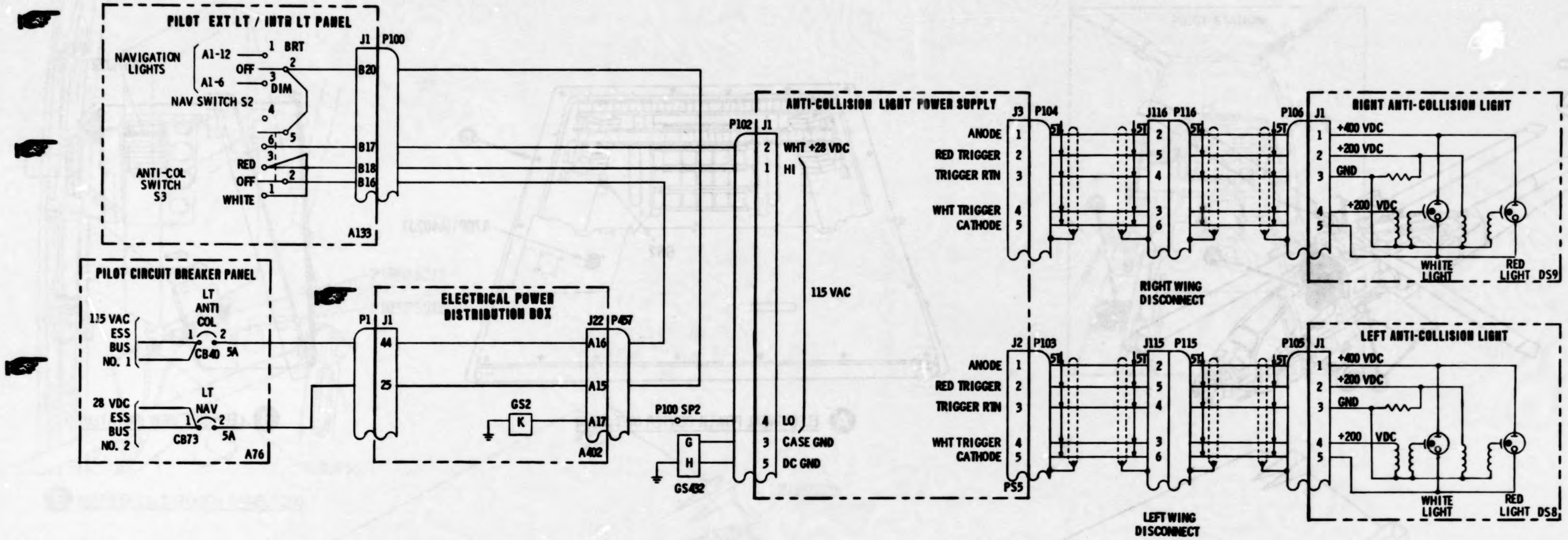
Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.

TASK	RESULT
2. On EXT LT/INTR LT panel, set ANTI-COL switch to RED. Check that left and right red anti-collision lights are flashing.	If LT ANTI COL circuit breaker does not stay closed, go to para 9-8-6. If left and right red anti-collision lights do not flash, go to para 9-8-4. If left red anti-collision light is not flashing, go to para 9-8-8. If right red anti-collision light is not flashing, go to para 9-8-9.
3. With ANTI-COL switch set to WHITE, check that left and right white anti-collision lights are flashing.	If LT NAV circuit breaker does not stay closed, go to para 9-8-7. If left and right white anti-collision lights do not flash, go to para 9-8-5. If left white anti-collision light is not flashing, go to para 9-8-10. If right white anti-collision light is not flashing, go to para 9-8-11.
4. On EXT LT/INTR LT panel, set ANTI-COL switch to OFF.	

B. Remove external power - Electrical (TM 55-1520-238-23).

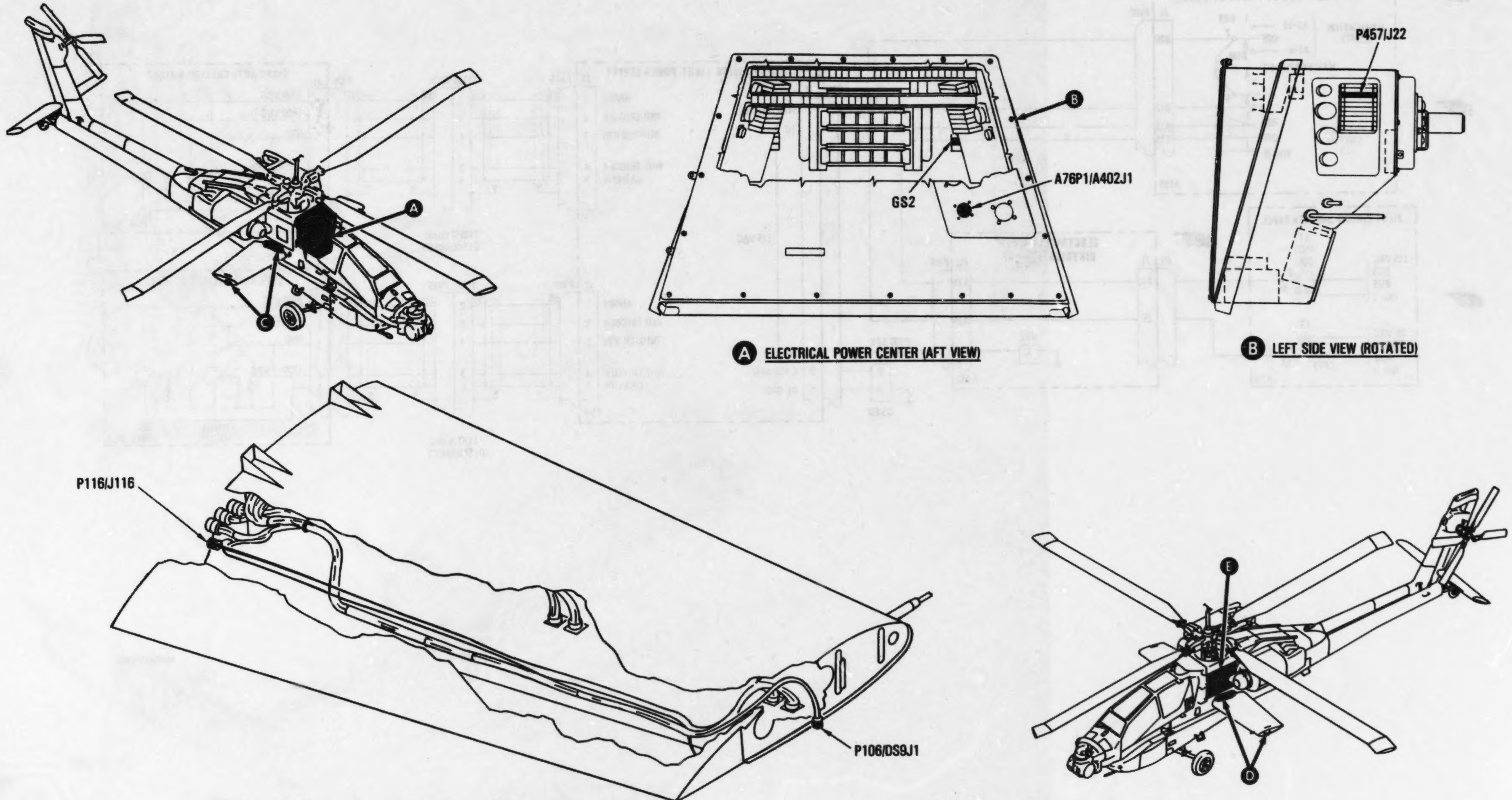
END OF TASK

9-8-2. ANTI-COLLISION LIGHTS - INTERCONNECTION DIAGRAM


PILOT EXT LT / INTR LT PANEL
NAVIGATION LIGHTS
A1-12
A1-6
1 BRT
OFF
2
3 DIM
4
5
6
NAV SWITCH S2
ANTI-COL SWITCH S3
RED
OFF
WHITE
J1
P100
B20
B17
B18
B16
A133
PILOT CIRCUIT BREAKER PANEL
115 VAC ESS BUS NO. 1
LT ANTI COL
CB40
5A
28 VDC ESS BUS NO. 2
LT NAV
CB73
5A
A76
ELECTRICAL POWER DISTRIBUTION BOX
P1
J1
44
25
J22
P457
A16
A15
A17
GS2
K
A402
P100 SP2
G
H
GS432
ANTI-COLLISION LIGHT POWER SUPPLY
P102
J1
2 WHT +28 VDC
1 HI
115 VAC
4 LO
3 CASE GND
5 DC GND
PS5
J3
P104
J2
P103
ANODE
RED TRIGGER
TRIGGER RTN
WHT TRIGGER
CATHODE
ST
J116
P116
RIGHT WING DISCONNECT
J115
P115
LEFT WING DISCONNECT
P106
P105
RIGHT ANTI-COLLISION LIGHT
LEFT ANTI-COLLISION LIGHT
+400 VDC
+200 VDC
GND
+200 VDC
WHITE LIGHT
RED LIGHT
DS9
DS8

MM04/1-7288

9-8-3. ANTI-COLLISION LGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
B
C
GS2
A76P1/A402J1
P457/J22
P116/J116
P106/DS9J1
E
D

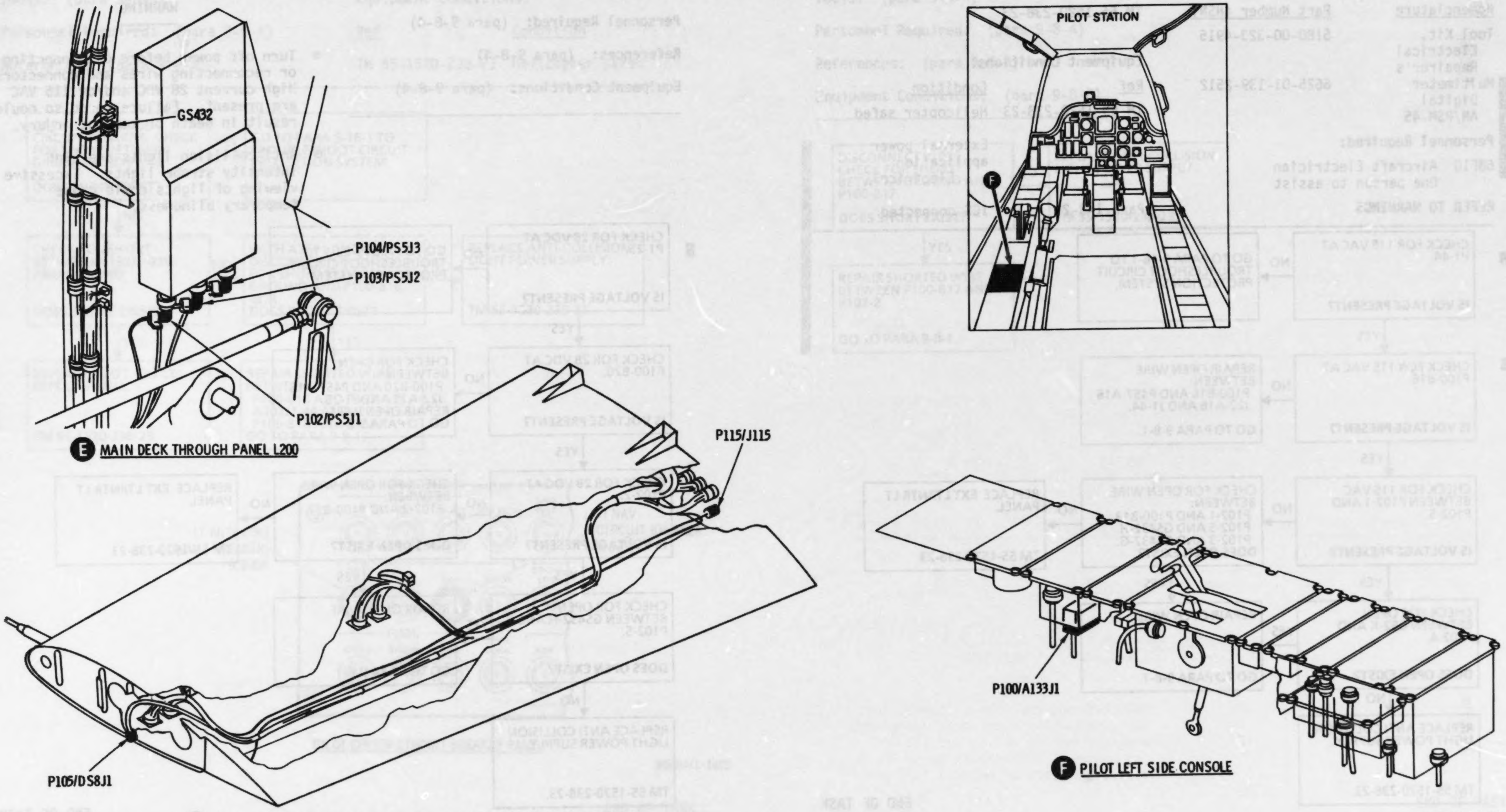
A ELECTRICAL POWER CENTER (AFT VIEW)

B LEFT SIDE VIEW (ROTATED)

C RIGHT WING WITH ANTI-COLLISION LIGHT AND FAIRING RW10 REMOVED

MM04/1-1212-1A

9-8-3. ANTI-COLLISION LGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


GS432
P104/PS5J3
P103/PS5J2
P102/PS5J1
P115/J115
P105/DS8J1
PILOT STATION
F
P100/A133J1

E MAIN DECK THROUGH PANEL L200

D LEFT WING WITH ANTI - COLLISION LIGHT AND FAIRING LW10 REMOVED

F PILOT LEFT SIDE CONSOLE

MM04/1212-2A

9-8-4. RED ANTI-COLLISION LIGHTS - DO NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

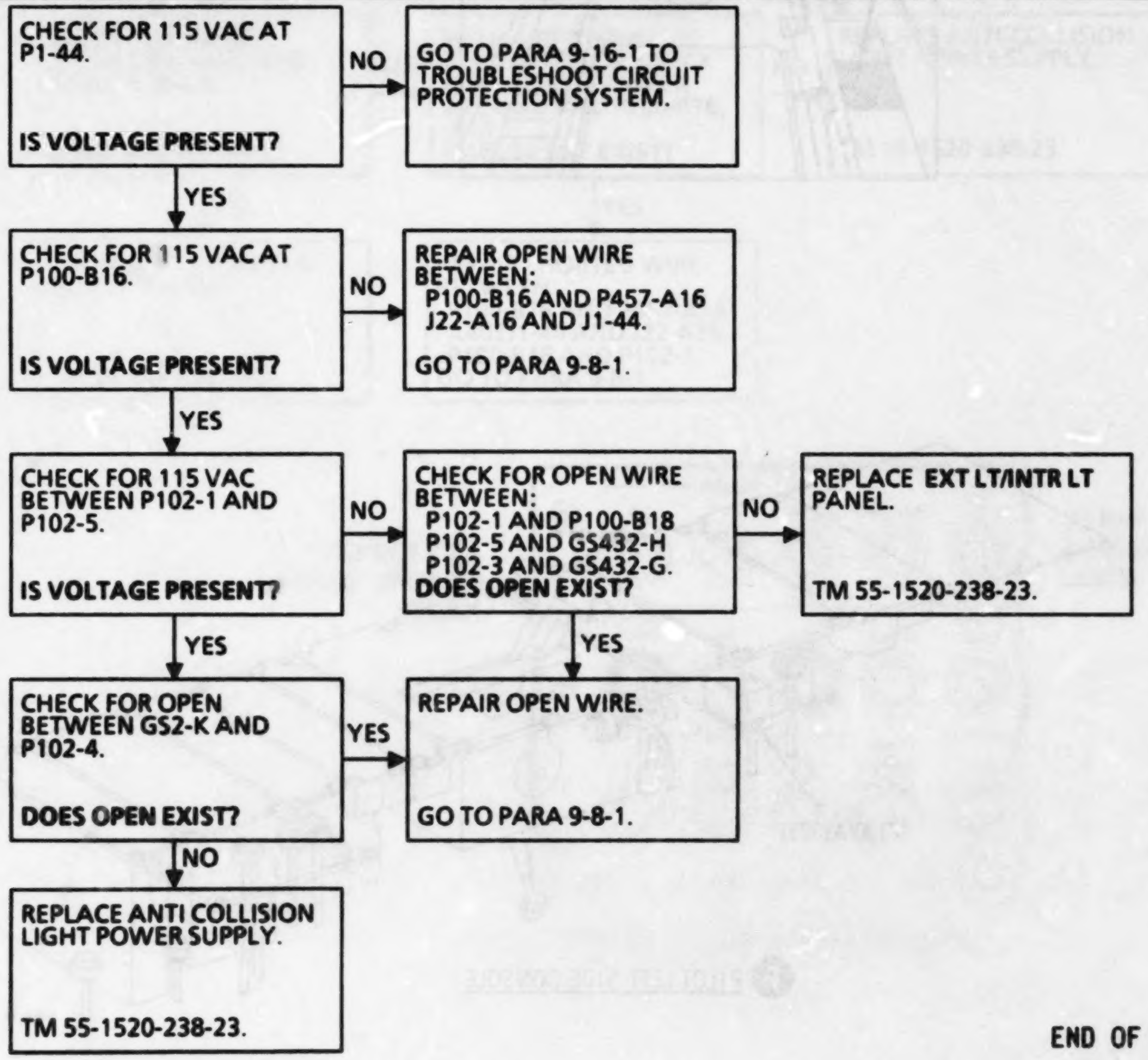
REFER TO WARNINGS

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
Para 1-3-2	ICS connected


CHECK FOR 115 VAC AT P1-44.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR 115 VAC AT P100-B16.
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN: P100-B16 AND P457-A16 J22-A16 AND J1-44.
GO TO PARA 9-8-1.
YES
CHECK FOR 115 VAC BETWEEN P102-1 AND P102-5.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN: P102-1 AND P100-B18 P102-5 AND GS432-H P102-3 AND GS432-G.
DOES OPEN EXIST?
NO
REPLACE EXT LT/INTR LT PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-8-1.
YES
CHECK FOR OPEN BETWEEN GS2-K AND P102-4.
DOES OPEN EXIST?
YES
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.

END OF TASK

9-8-5. WHITE ANTI-COLLISION LIGHTS - DO NOT FUNCTION

Tools: (para 9-8-4)

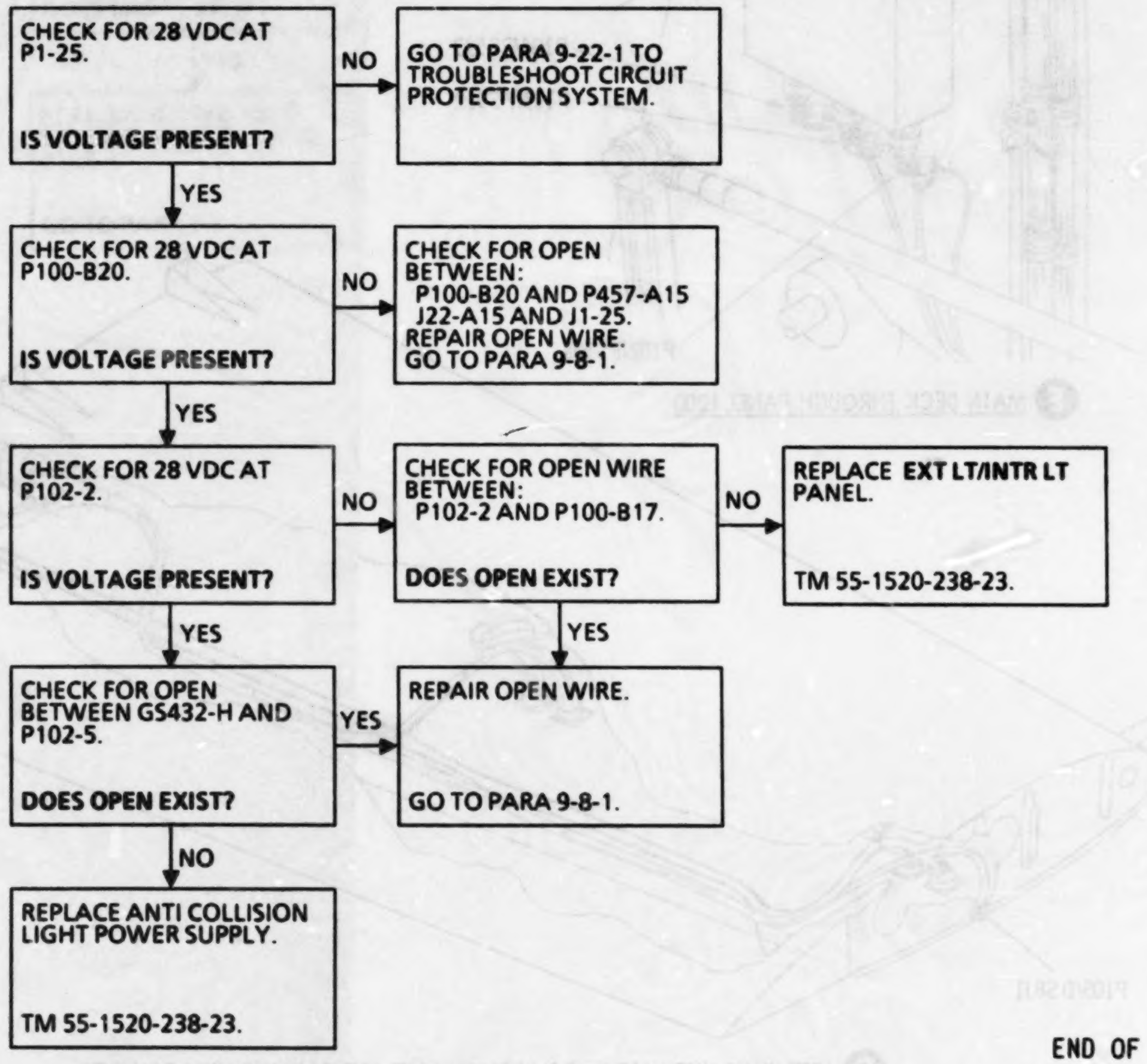
Personnel Required: (para 9-8-4)

References: (para 9-8-4)

Equipment Conditions: (para 9-8-4)

WARNING

- Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.
- Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.


CHECK FOR 28 VDC AT P1-25.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-22-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR 28 VDC AT P100-B20.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN: P100-B20 AND P457-A15 J22-A15 AND J1-25. REPAIR OPEN WIRE. GO TO PARA 9-8-1.
YES
CHECK FOR 28 VDC AT P102-2.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN: P102-2 AND P100-B17.
DOES OPEN EXIST?
NO
REPLACE EXT LT/INTR LT PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-8-1.
YES
CHECK FOR OPEN BETWEEN GS432-H AND P102-5.
DOES OPEN EXIST?
YES
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.

END OF TASK

9-8-6. LT ANTI COL CIRCUIT BREAKER (CB40) - DOES NOT STAY CLOSED

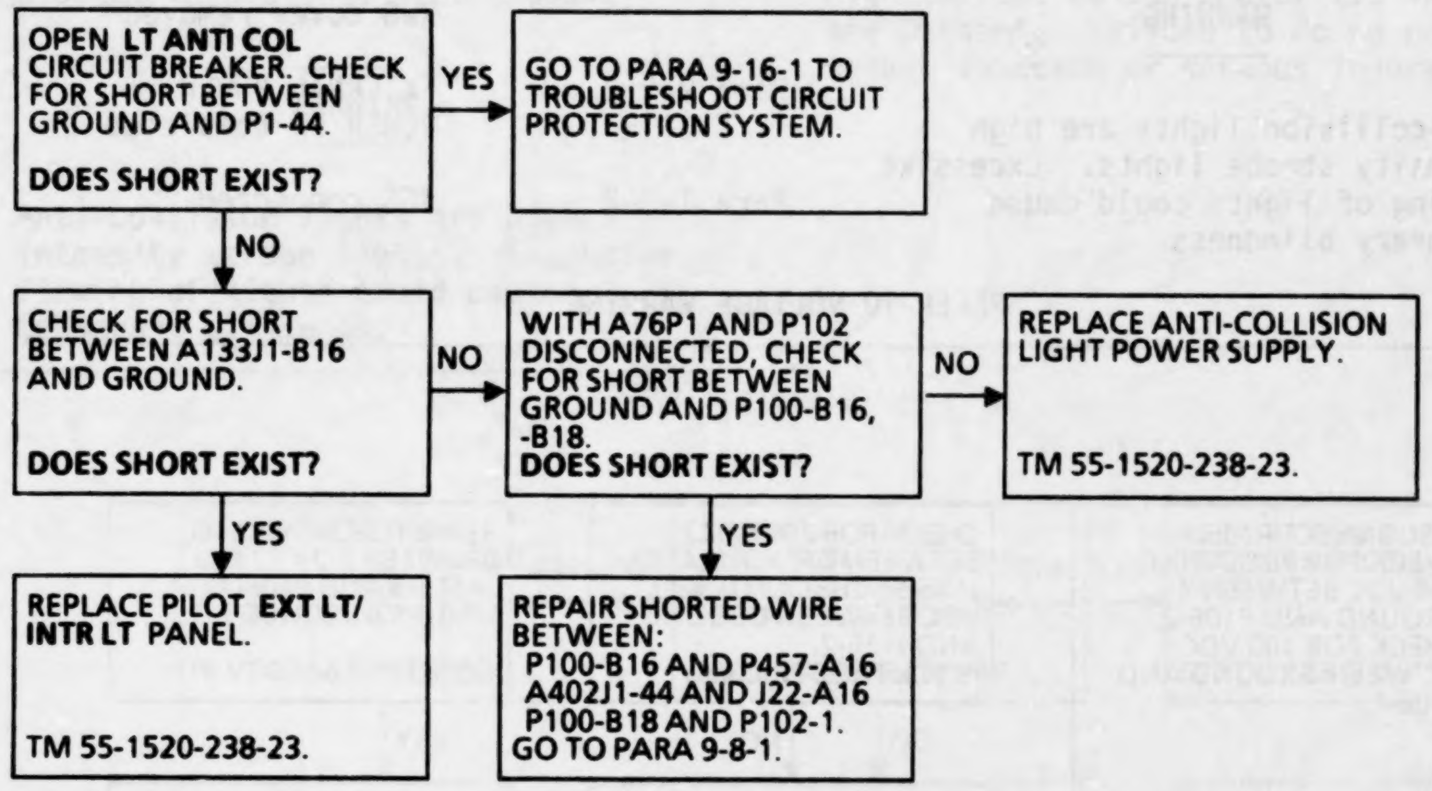
Tools: (para 9-8-4)

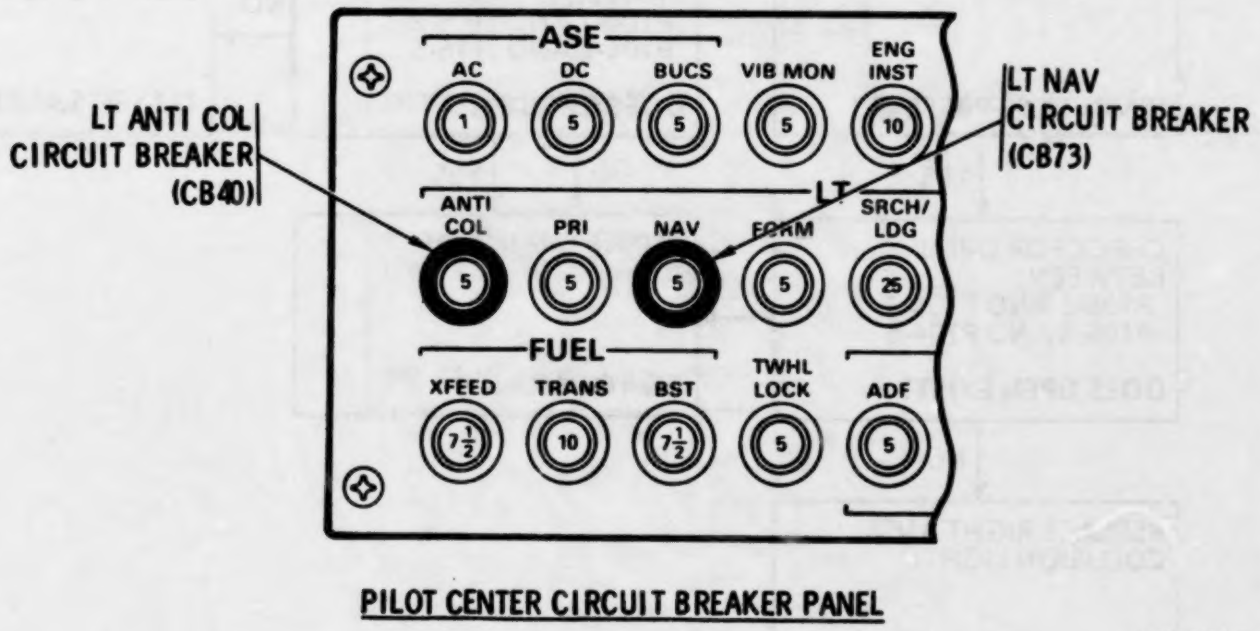
Personnel Required: (para 9-8-4)

References: (para 9-8-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN LT ANTI COL CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND P1-44.
DOES SHORT EXIST?
YES
GO TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
CHECK FOR SHORT BETWEEN A133J1-B16 AND GROUND.
DOES SHORT EXIST?
NO
WITH A76P1 AND P102 DISCONNECTED, CHECK FOR SHORT BETWEEN GROUND AND P100-B16, -B18.
DOES SHORT EXIST?
NO
REPLACE ANTI-COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.
YES
REPLACE PILOT EXT LT/ INTR LT PANEL.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN:
P100-B16 AND P457-A16
A402J1-44 AND J22-A16
P100-B18 AND P102-1.
GO TO PARA 9-8-1.


LT ANTI COL CIRCUIT BREAKER (CB40)
LT NAV CIRCUIT BREAKER (CB73)
ASE
AC
1
DC
5
BUCS
5
VIB MON
5
ENG INST
10
LT
ANTI COL
5
PRI
5
NAV
5
FORM
5
SRCH/ LDG
25
FUEL
XFEED
7 1/2
TRANS
10
BST
7 1/2
TWHL LOCK
5
ADF
5

PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1453

END OF TASK

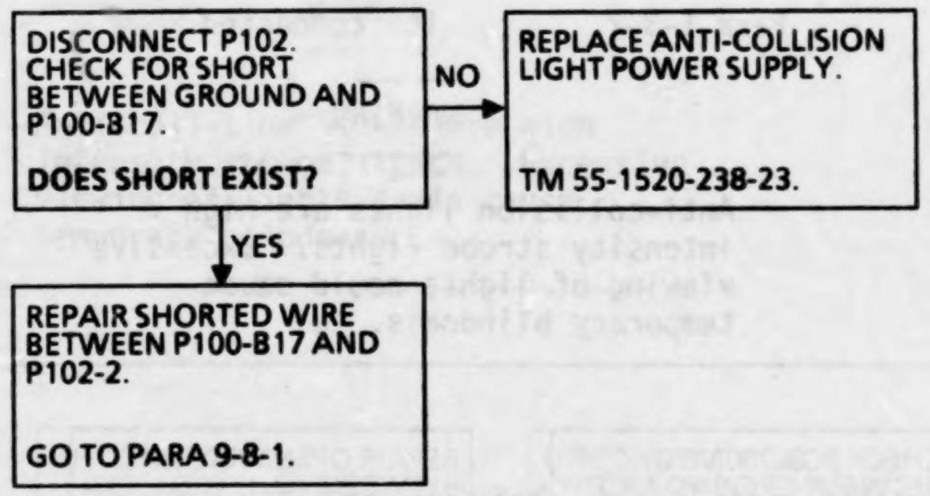
9-8-7. LT NAV CIRCUIT BREAKER (CB73) - DOES NOT STAY CLOSED

Tools: (para 9-8-4)

Personnel Required: (para 9-8-4)

References: (para 9-8-4)

Equipment Conditions: (para 9-8-6)


DISCONNECT P102. CHECK FOR SHORT BETWEEN GROUND AND P100-B17.
DOES SHORT EXIST?
NO
REPLACE ANTI-COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN P100-B17 AND P102-2.
GO TO PARA 9-8-1.

END OF TASK

9-8-8. LEFT WING RED ANTI-COLLISION LIGHT - DOES NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

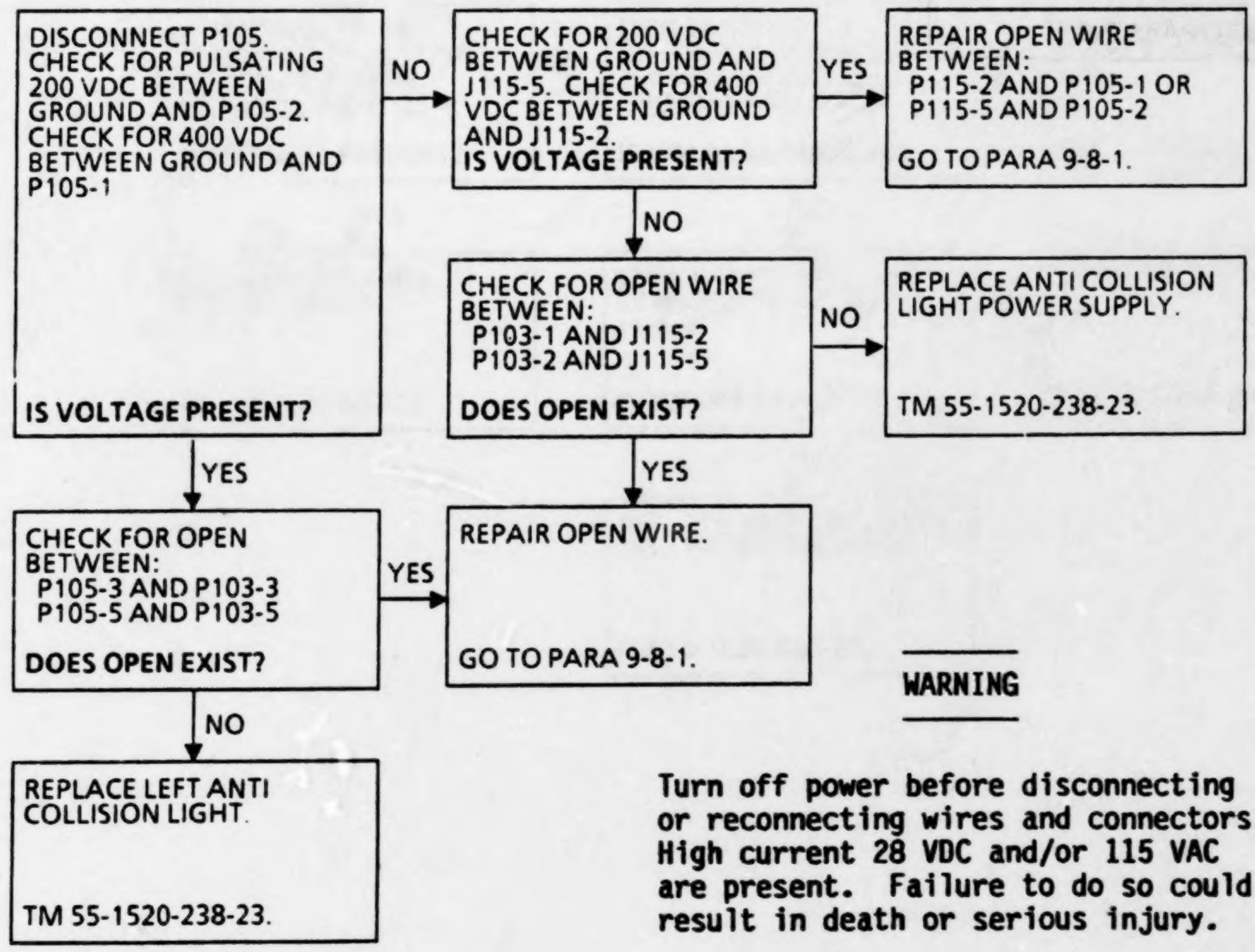
REFER TO VOLTAGE WARNING

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - LW8 cover removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

WARNING

Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.


DISCONNECT P105. CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND P105-2. CHECK FOR 400 VDC BETWEEN GROUND AND P105-1
IS VOLTAGE PRESENT?
NO
CHECK FOR 200 VDC BETWEEN GROUND AND J115-5. CHECK FOR 400 VDC BETWEEN GROUND AND J115-2.
IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN: P115-2 AND P105-1 OR P115-5 AND P105-2
GO TO PARA 9-8-1.
NO
CHECK FOR OPEN WIRE BETWEEN: P103-1 AND J115-2 P103-2 AND J115-5
DOES OPEN EXIST?
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-8-1.
YES
CHECK FOR OPEN BETWEEN: P105-3 AND P103-3 P105-5 AND P103-5
DOES OPEN EXIST?
YES
NO
REPLACE LEFT ANTI COLLISION LIGHT.
TM 55-1520-238-23.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-8-9. RIGHT WING RED ANTI-COLLISION LIGHT - DOES NOT FUNCTION

Tools: (para 9-8-8)

Personnel Required: (para 9-8-8)

References: (para 9-8-8)

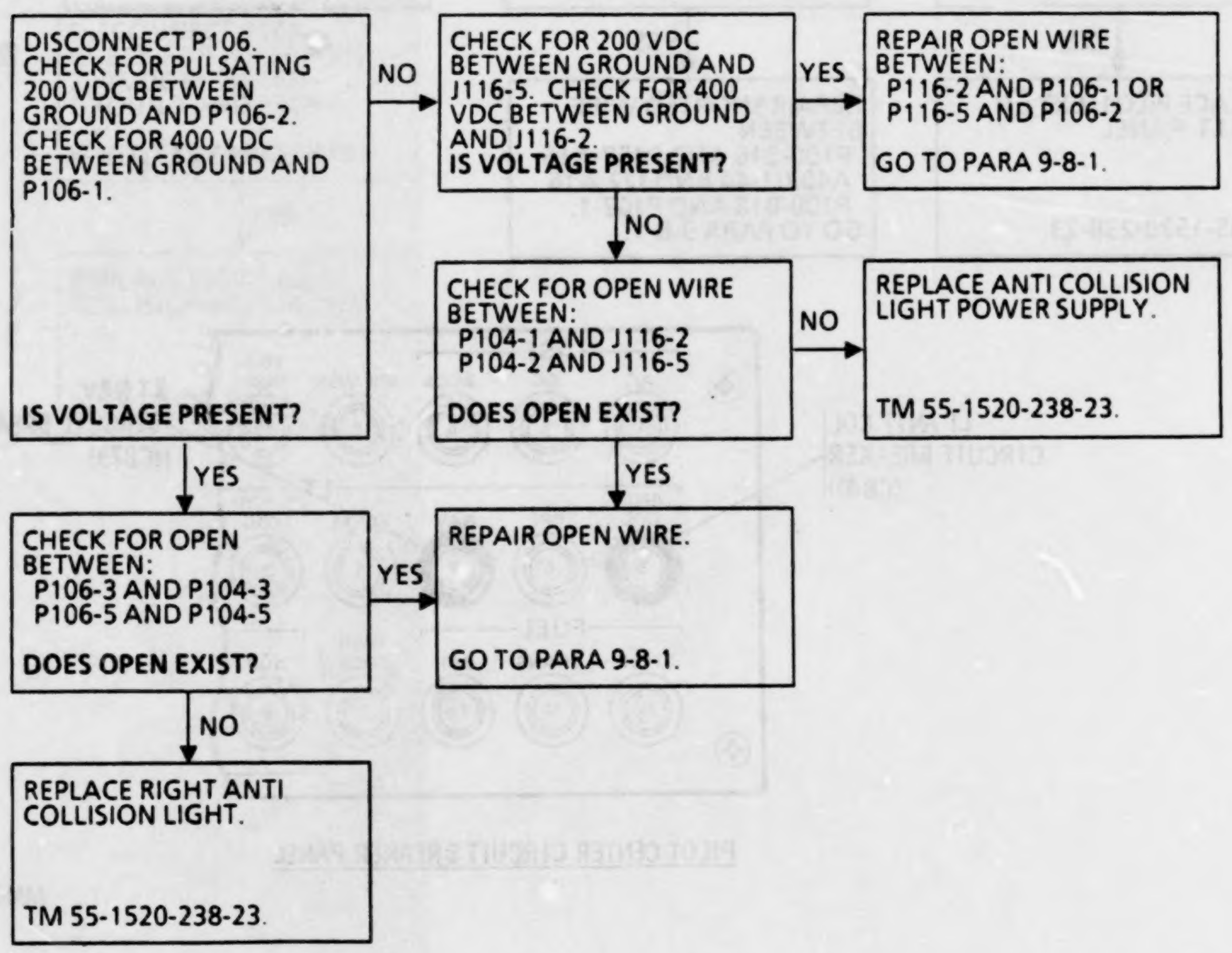
WARNING

Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - RW8 cover removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

REFER TO VOLTAGE WARNING


DISCONNECT P106. CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND P106-2. CHECK FOR 400 VDC BETWEEN GROUND AND P106-1.
IS VOLTAGE PRESENT?
NO
CHECK FOR 200 VDC BETWEEN GROUND AND J116-5. CHECK FOR 400 VDC BETWEEN GROUND AND J116-2.
IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN: P116-2 AND P106-1 OR P116-5 AND P106-2
GO TO PARA 9-8-1.
NO
CHECK FOR OPEN WIRE BETWEEN: P104-1 AND J116-2 P104-2 AND J116-5
DOES OPEN EXIST?
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-8-1.
YES
CHECK FOR OPEN BETWEEN: P106-3 AND P104-3 P106-5 AND P104-5
DOES OPEN EXIST?
YES
NO
REPLACE RIGHT ANTI COLLISION LIGHT.
TM 55-1520-238-23.

END OF TASK

9-8-10. LEFT WING WHITE ANTI-COLLISION LIGHT - DOES NOT FUNCTION

Tools: (para 9-8-8)

Personnel Required: (para 9-8-8)

References: (para 9-8-8)

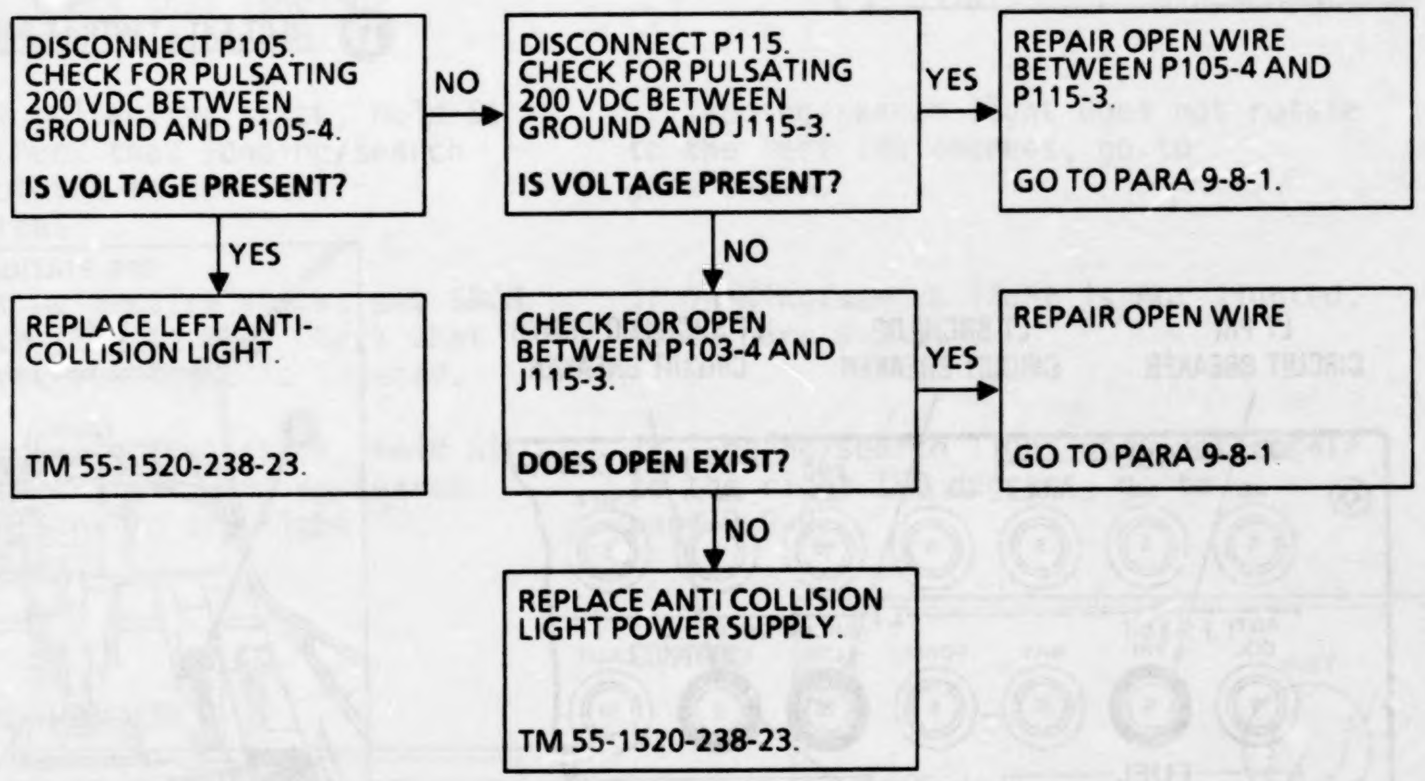
Equipment Conditions: (para 9-8-8)

WARNING

Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P105. CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND P105-4.
IS VOLTAGE PRESENT?
NO
DISCONNECT P115. CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND J115-3.
IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN P105-4 AND P115-3.
GO TO PARA 9-8-1.
YES
REPLACE LEFT ANTI-COLLISION LIGHT.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN P103-4 AND J115-3.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-8-1
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.

END OF TASK

9-8-11. RIGHT WING WHITE ANTI-COLLISION LIGHT - DOES NOT FUNCTION

Tools: (para 9-8-8)

Personnel Required: (para 9-8-8)

References: (para 9-8-8)

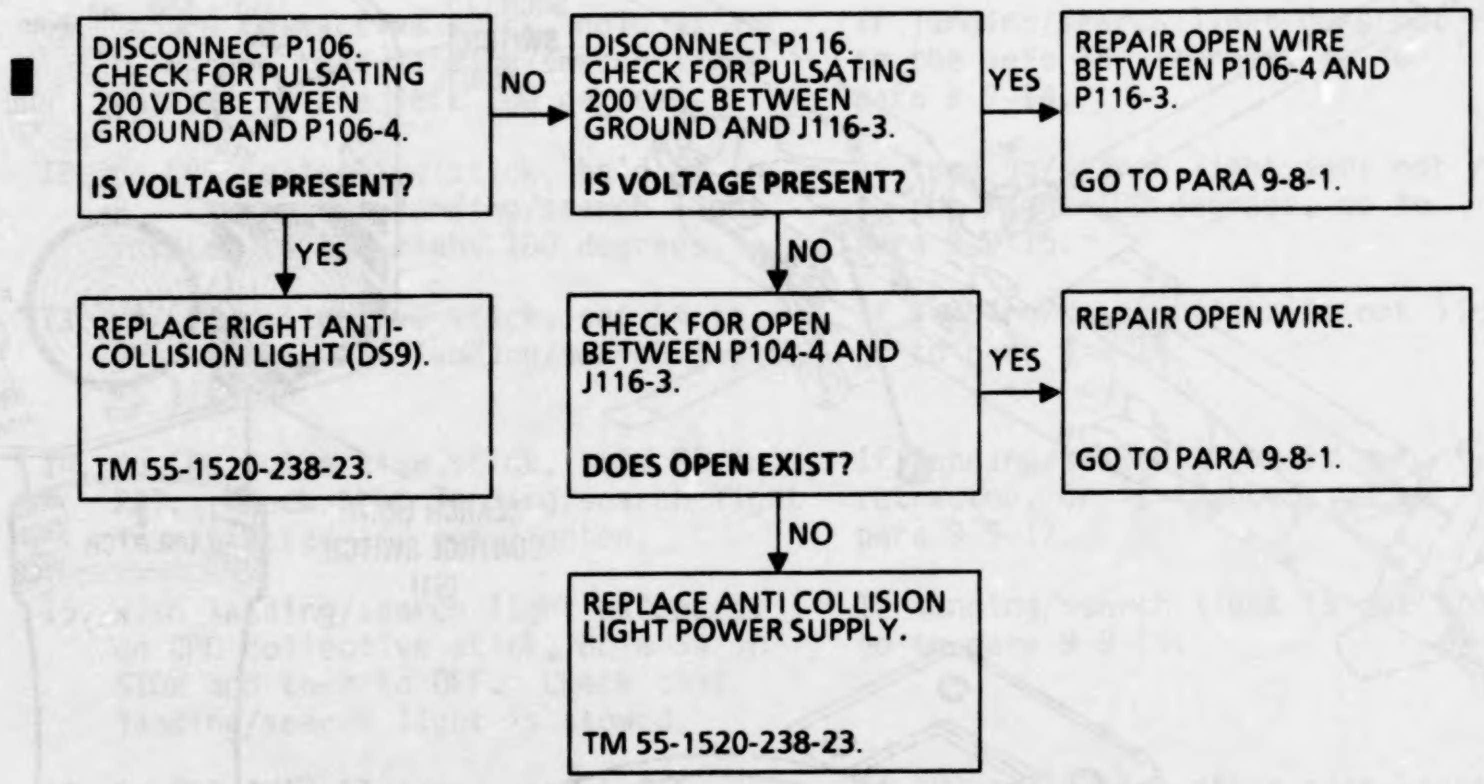
Equipment Conditions: (para 9-8-9)

WARNING

Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P106. CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND P106-4.
IS VOLTAGE PRESENT?
NO
DISCONNECT P116. CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND J116-3.
IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN P106-4 AND P116-3.
GO TO PARA 9-8-1.
YES
REPLACE RIGHT ANTI-COLLISION LIGHT (DS9).
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN P104-4 AND J116-3.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-8-1.
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.

END OF TASK

9-9-1. LANDING/SEARCH LIGHT - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

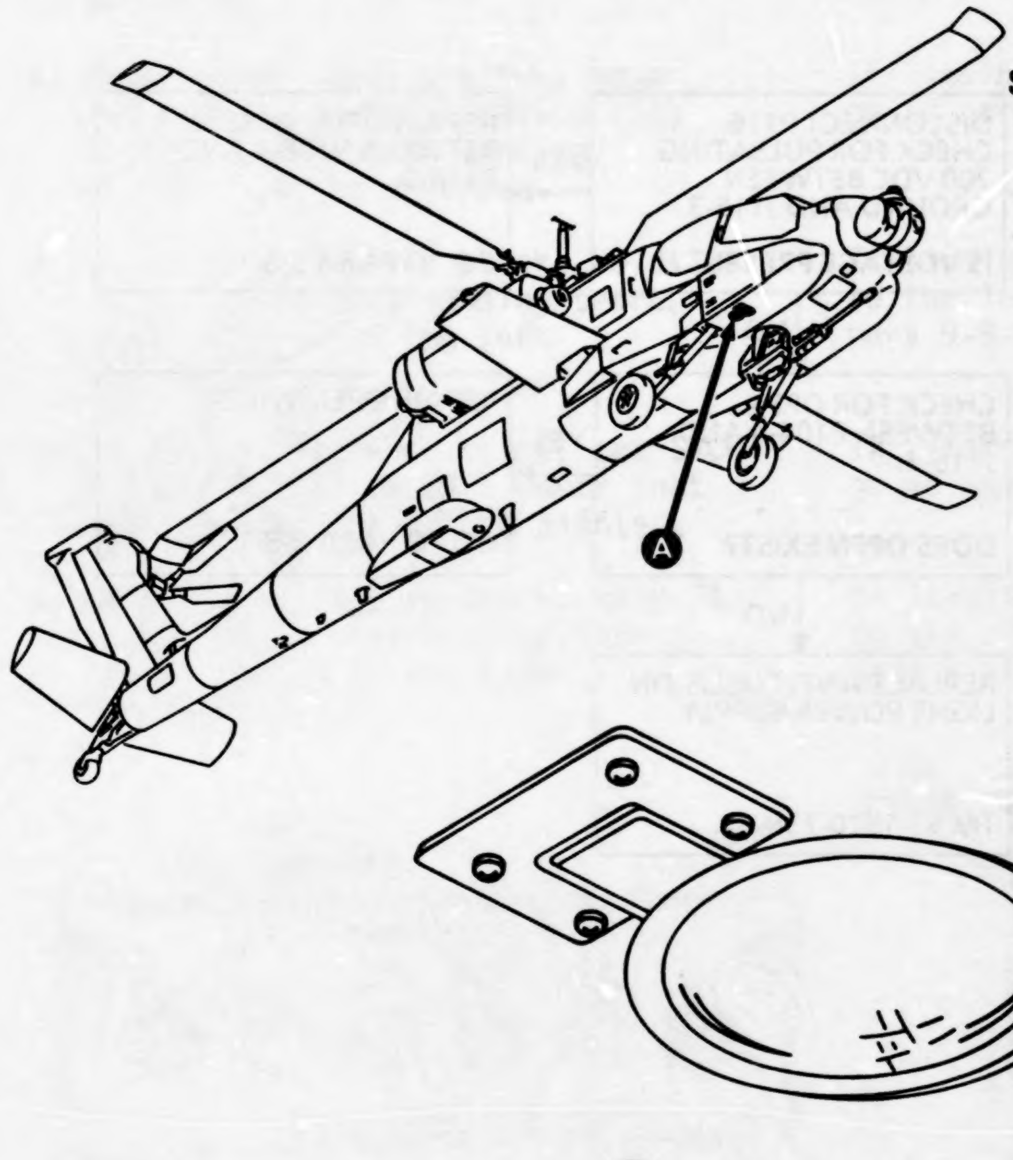
68F10 Aircraft Electrician

References:

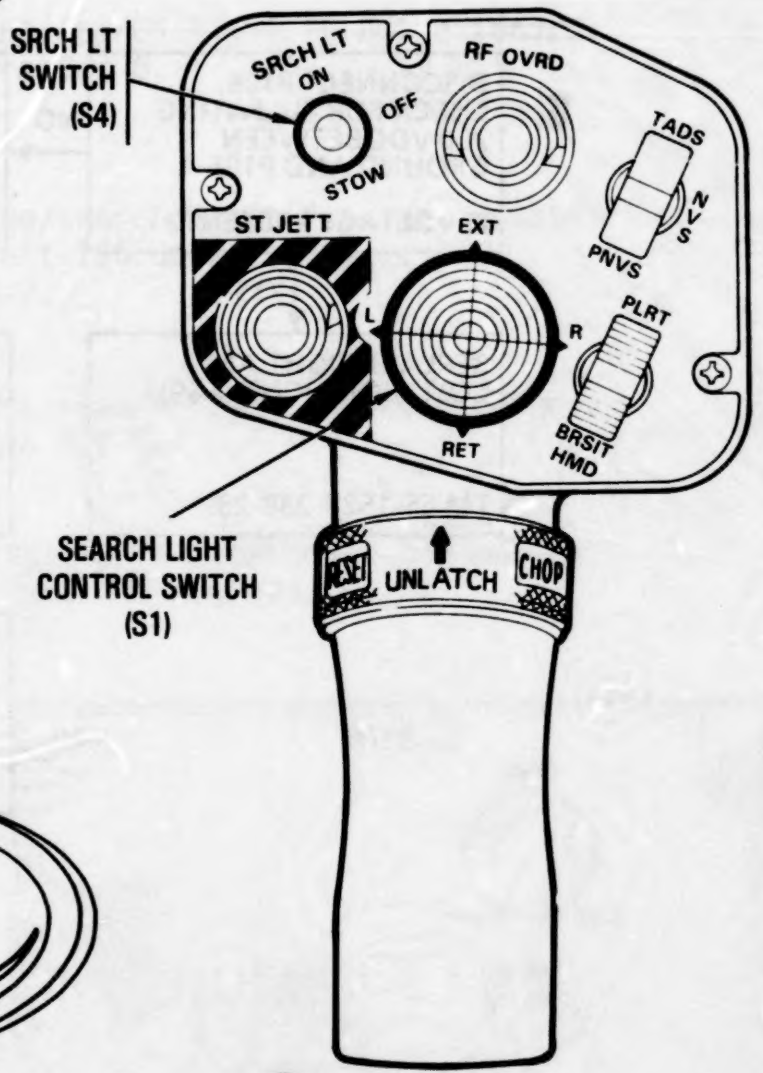
TM 55-1520-238-23

Equipment Conditions:

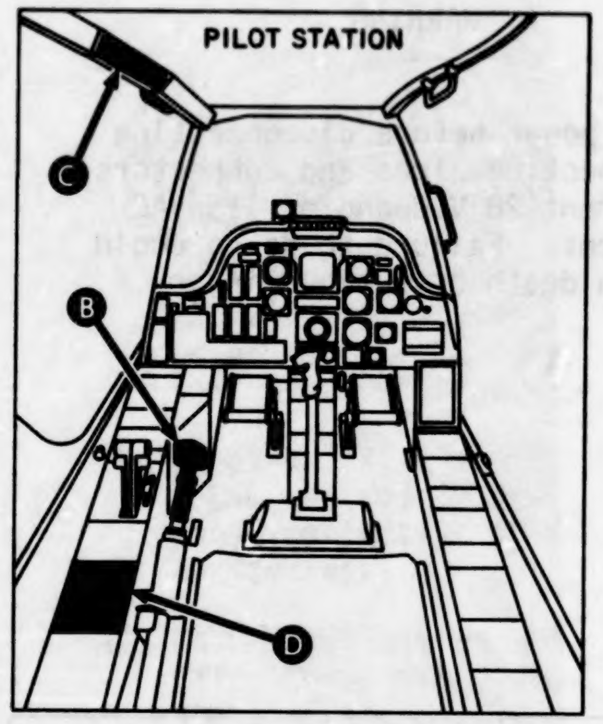
Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

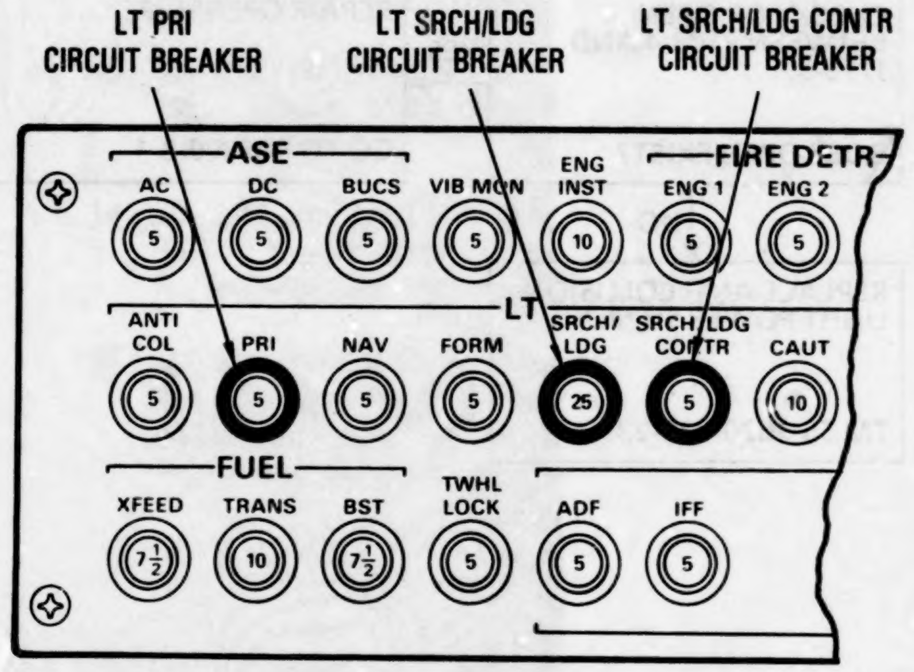


Ⓐ LANDING/SEARCH LIGHT

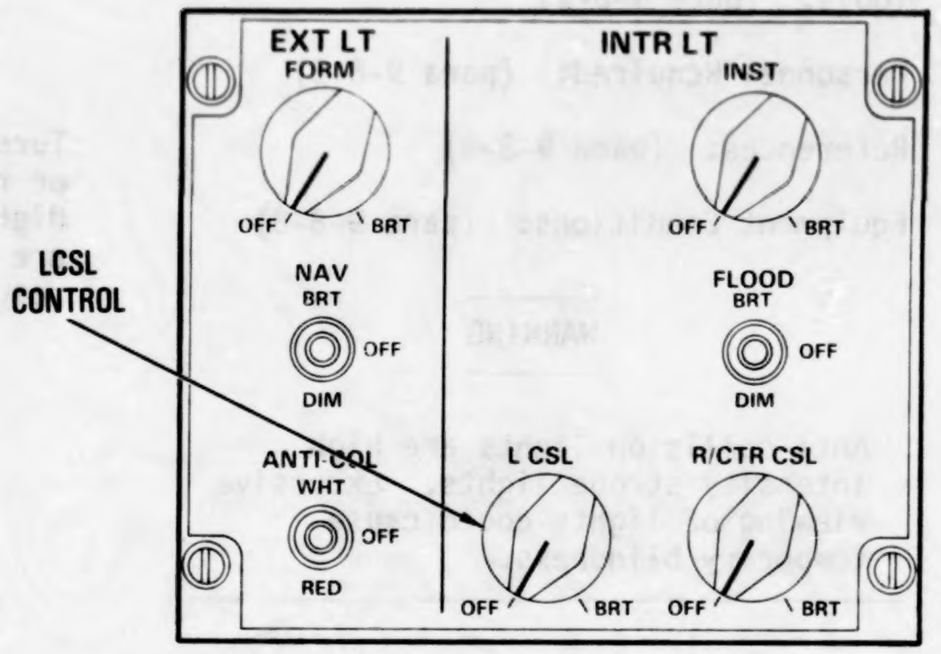

SRCH LT
SWITCH
(S4)
SRCH LT
ON
OFF
STOW
RF OVRD
TADS
N
W
S
PNVS
ST JETT
EXT
L
R
RET
PLRT
BRSIT
HMD
SEARCH LIGHT
CONTROL SWITCH
(S1)
RESET
UNLATCH
CHOP

Ⓑ COLLECTIVE STICK
(TYPICAL)

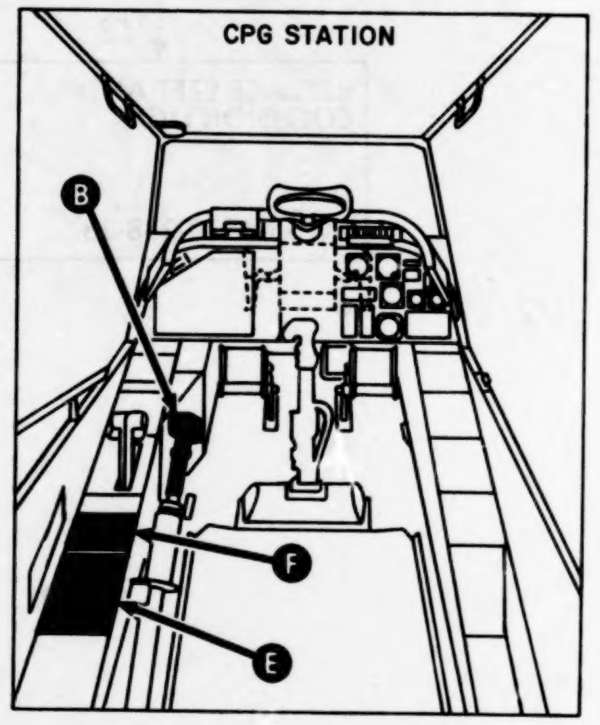

PILOT STATION
C
B
D


LT PRI
CIRCUIT BREAKER
LT SRCH/LDG
CIRCUIT BREAKER
LT SRCH/LDG CONTR
CIRCUIT BREAKER
ASE
AC
DC
BUCS
VIB MON
ENG INST
FIRE DETR
ENG 1
ENG 2
5
5
5
5
10
5
5
LT
ANTI COL
PRI
NAV
FORM
SRCH/ LDG
SRCH LDG CONTR
CAUT
5
5
5
5
25
5
10
FUEL
XFEED
TRANS
BST
TWHL LOCK
ADF
IFF
7½
10
7½
5
5
5

Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL


LCSL
CONTROL
EXT LT
FORM
OFF
BRT
NAV
BRT
OFF
DIM
ANTI COL
WHT
OFF
RED
INTR LT
INST
OFF
BRT
FLOOD
BRT
OFF
DIM
L CSL
OFF
BRT
R/CTR CSL
OFF
BRT

Ⓓ PILOT EXT LT/INTR LT PANEL


CPG STATION
B
F
E

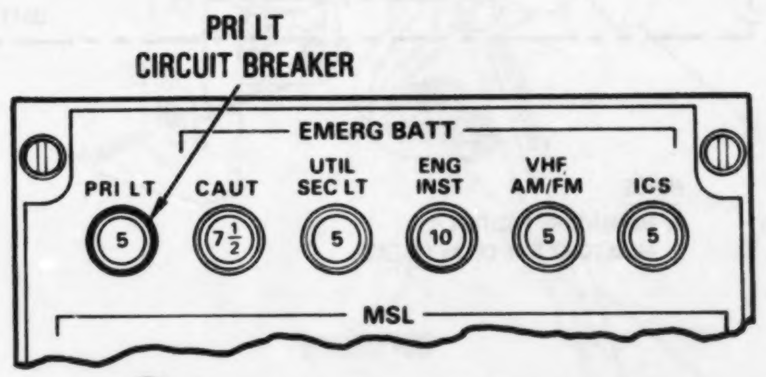
MM04/1-1023-1A

GO TO NEXT PAGE

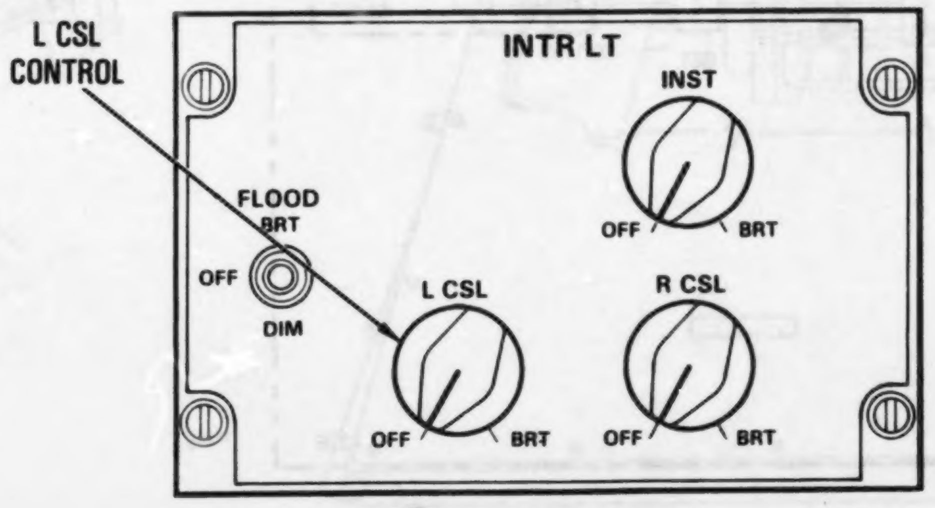
9-9-1. LANDING/SEARCH LIGHT - OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On pilot center circuit breaker panel, check that **LT SRCH/LDG**, **LT SRCH/LDG CONTR**, and **LT PRI** circuit breakers are closed.	If **LT SRCH/LDG** circuit breaker does not stay closed, go to para 9-9-4. If **LT SRCH/LDG CONTR** circuit breaker does not stay closed, go to para 9-9-5. If **LT PRI** circuit breaker does not stay closed, go to para 9-13-1.
2. On CPG circuit breaker panel No. 1, check that **PRI LT** circuit breaker is closed.	If **PRI LT** circuit breaker does not stay closed, go to para 9-14-1.
3. On pilot collective stick, hold search light control switch (S1) in **EXT**. Check that landing/search light is extended.	If landing/search light is not extended, go to para 9-9-6.
4. On pilot collective stick, hold S1 in **L**. Check that landing/search light rotates to the left 180 degrees.	If landing/search light does not rotate to the left 180 degrees, go to para 9-9-7.
5. On pilot collective stick, set **SRCH LT** switch (S4) to **ON**. Check that landing/search light is lighted.	If landing/search light is not lighted, go to para 9-9-8.
6. On pilot collective stick, hold S1 in **R**. Check that landing/search light rotates to the right 180 degrees.	If landing/search light does not rotate to the right 180 degrees, go to para 9-9-9.
7. On pilot collective stick, hold S1 in **RET**. Check that landing/search light is retracted and not lighted.	If landing/search light is not retracted or is lighted, go to para 9-9-10.
8. With landing/search light extended on pilot collective stick, hold S4 in **STOW** and return to **OFF**. Check that landing/search light is stowed.	If landing/search light is not stowed, go to para 9-9-11.
9. On pilot **EXT LT/INTR LT** panel, set **L CSL** control to **BRT**. Check that pilot collective stick edge-light is lighted.	If pilot collective stick edge-light is not lighted, go to para 9-9-12.
10. On CPG collective stick, hold S1 in **EXT**. Check that landing/search light is extended.	If landing/search light is not extended, go to para 9-9-13.
11. On CPG collective stick, hold S1 in **L**. Check that landing/search light rotates to the left 180 degrees.	If landing/search light does not rotate to the left 180 degrees, go to para 9-9-14.
12. On CPG collective stick, hold S1 in **R**. Check that landing/search light rotates to the right 180 degrees.	If landing/search light does not rotate to the right 180 degrees, go to para 9-9-15.
13. On CPG collective stick, set S4 to **ON**. Check that landing/search light is lighted.	If landing/search light is not lighted, go to para 9-9-16.
14. On CPG collective stick, hold S1 in **RET**. Check that landing/search light is retracted and not lighted.	If landing/search light is not retracted, or is lighted, go to para 9-9-17.
15. With landing/search light extended, on CPG collective stick, hold S4 in **STOW** and then to **OFF**. Check that landing/search light is stowed.	If landing/search light is not stowed, go to para 9-9-18.
16. On CPG **INTR LT** panel, set **L CSL** control to **BRT**. Check that CPG collective stick edge-light is lighted.	If CPG collective stick edge-light is not lighted, go to para 9-9-19.



E CPG CIRCUIT BREAKER PANEL NO. 1



F CPG INTR LT PANEL

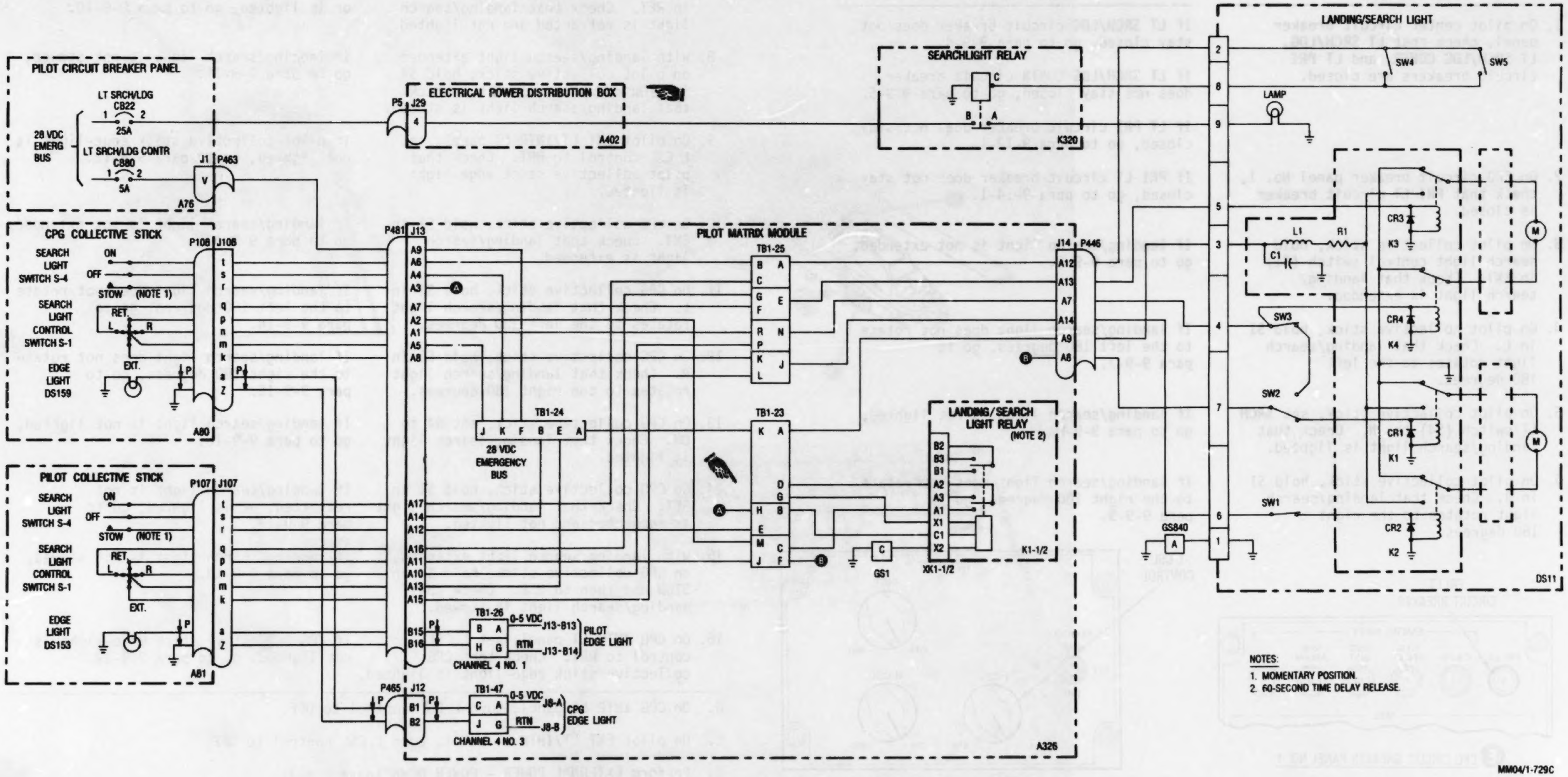
B. On CPG **INTR LT** panel, turn **L CSL** control to **OFF**.

C. On pilot **EXT LT/INTR LT** panel, turn **L CSL** control to **OFF**.

D. Perform **EXTERNAL POWER - POWER DOWN** (para 9-5-3).

END OF TASK

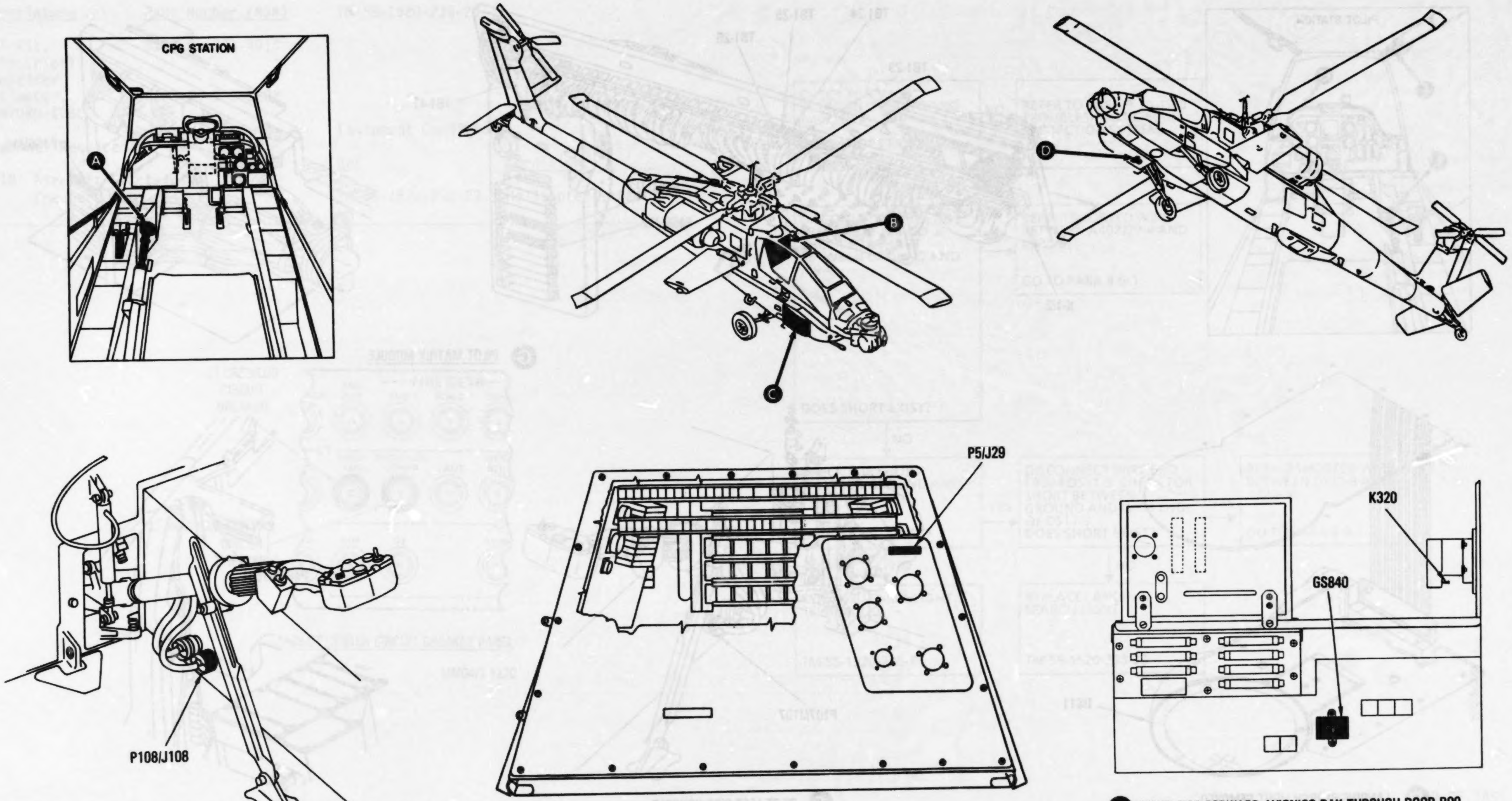
9-9-2. LANDING/SEARCH LIGHT - INTERCONNECTION DIAGRAM


PILOT CIRCUIT BREAKER PANEL
LT SRCH/LDG
CB22
25A
28 VDC EMERG BUS
LT SRCH/LDG CONTR
CB80
5A
J1 P463
V
A76
ELECTRICAL POWER DISTRIBUTION BOX
P5 J29
4
A402
CPG COLLECTIVE STICK
SEARCH LIGHT SWITCH S-4
ON
OFF
STOW (NOTE 1)
SEARCH LIGHT CONTROL SWITCH S-1
RET.
L
R
EXT.
EDGE LIGHT DS159
P108 J108
t s r q p n m k a Z
P
A80
PILOT COLLECTIVE STICK
EDGE LIGHT DS153
P107 J107
A81
P481 J13
A9 A6 A4 A3 A7 A2 A1 A5 A8
A17 A14 A12 A16 A11 A10 A13 A15 B15 B16
TB1-24
J K F B E A
28 VDC EMERGENCY BUS
TB1-26
0-5 VDC
RTN
J13-B13
J13-B14
PILOT EDGE LIGHT
CHANNEL 4 NO. 1
P465 J12
B1 B2
TB1-47
J8-A
J8-B
CPG EDGE LIGHT
CHANNEL 4 NO. 3
PILOT MATRIX MODULE
TB1-25
TB1-23
A
B
LANDING/SEARCH LIGHT RELAY (NOTE 2)
B2 B3 B1 A2 A3 A1 X1 C1 X2
K1-1/2
XK1-1/2
GS1
A326
SEARCHLIGHT RELAY
K320
J14 P446
A12 A13 A7 A14 A9 A8
GS840
LANDING/SEARCH LIGHT
2 8 9 5 3 4 7 6 1
SW4
SW5
LAMP
L1
R1
C1
CR3
K3
CR4
K4
SW3
SW2
CR1
K1
SW1
CR2
K2
M
DS11

NOTES:
1. MOMENTARY POSITION.
2. 60-SECOND TIME DELAY RELEASE.

MM04/1-729C

9-9-3. LANDING/SEARCH LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


CPG STATION
A
B
C
D
P5/J29
K320
GS840
P108/J108

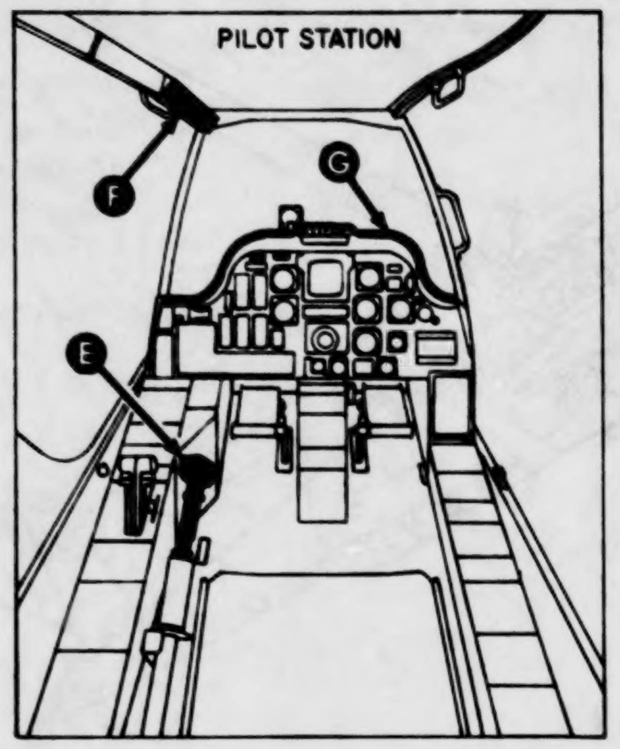
Ⓐ CPG LEFT SIDE CONSOLE

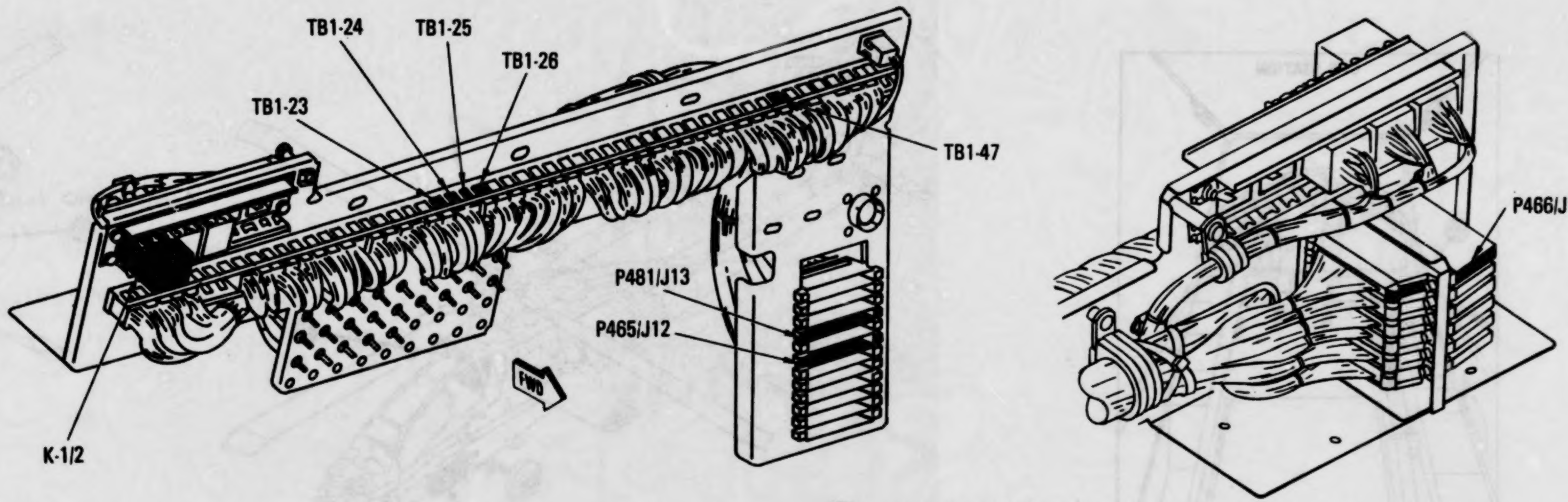
Ⓑ ELECTRICAL POWER CENTER

Ⓒ RIGHT SIDE FORWARD AVIONICS BAY THROUGH DOOR R90

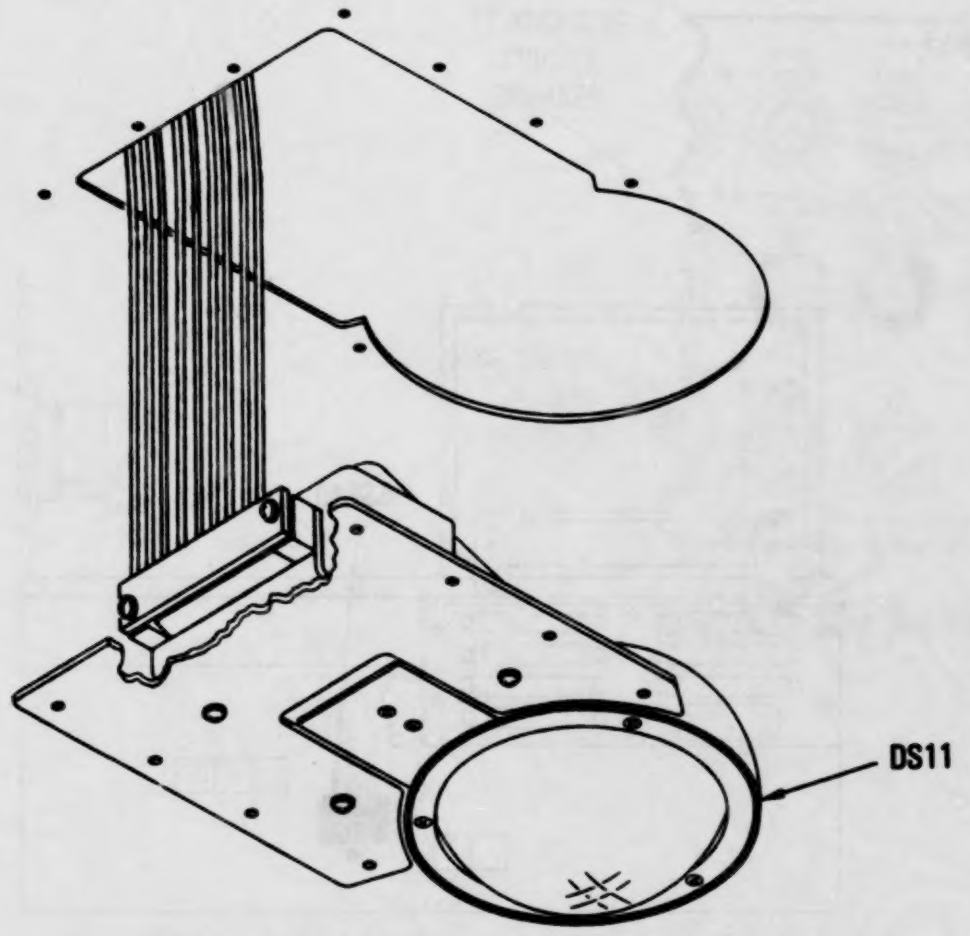
MM04/1-1218-1A

9-9-3. LANDING/SEARCH LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

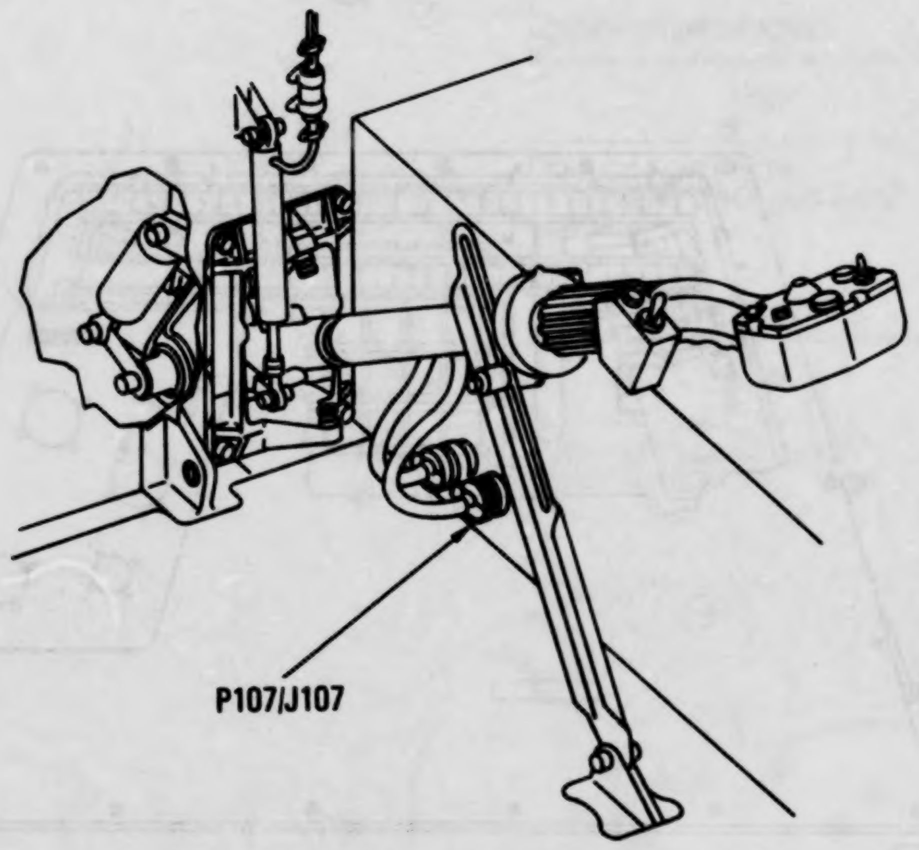

PILOT STATION
F
G
E


TB1-24
TB1-25
TB1-26
TB1-23
TB1-47
P481/J13
P465/J12
K-1/2
FWD
P466/J14

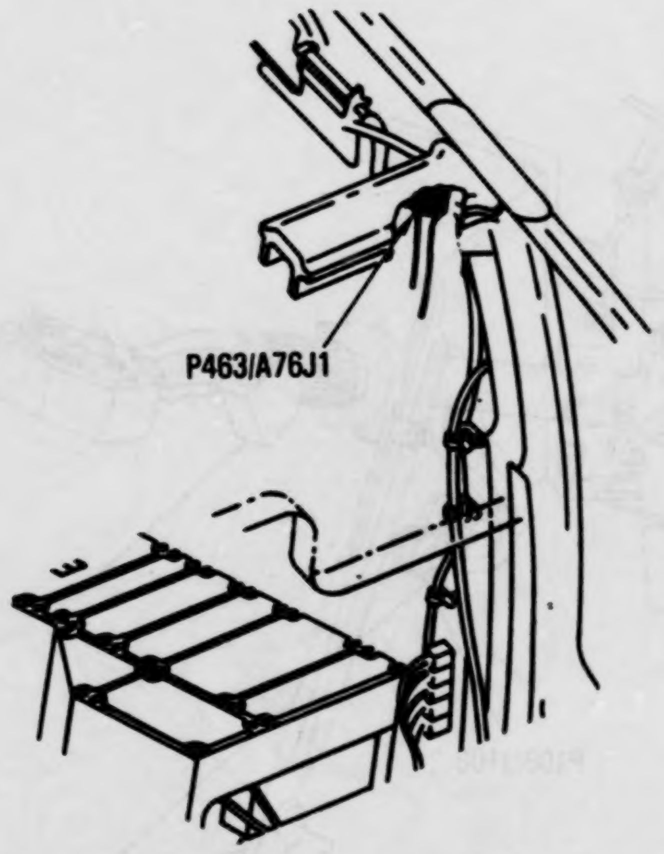
G PILOT MATRIX MODULE



D LANDING/SEARCH LIGHT REMOVED



E PILOT LEFT SIDE CONSOLE



F PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-1218-2A

best copy available

9-9-4. LT SRCH/LDG CIRCUIT BREAKER (CB22) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

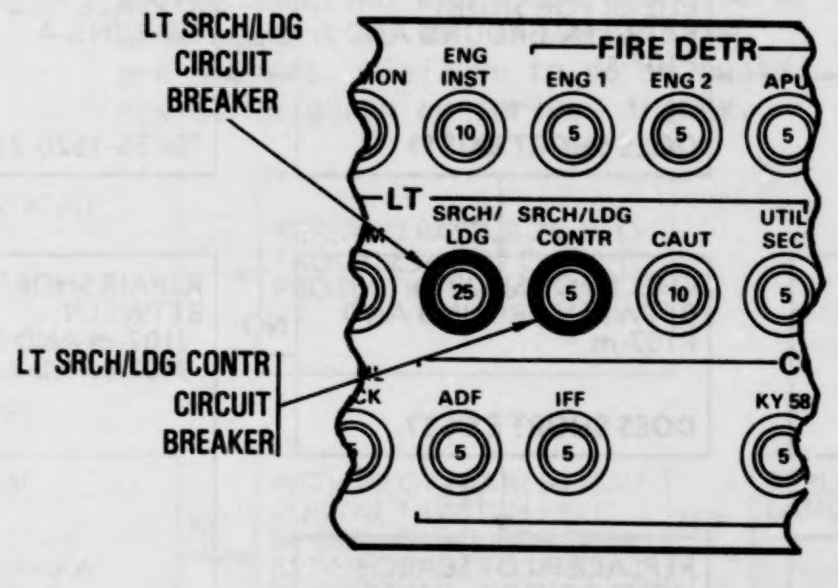
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

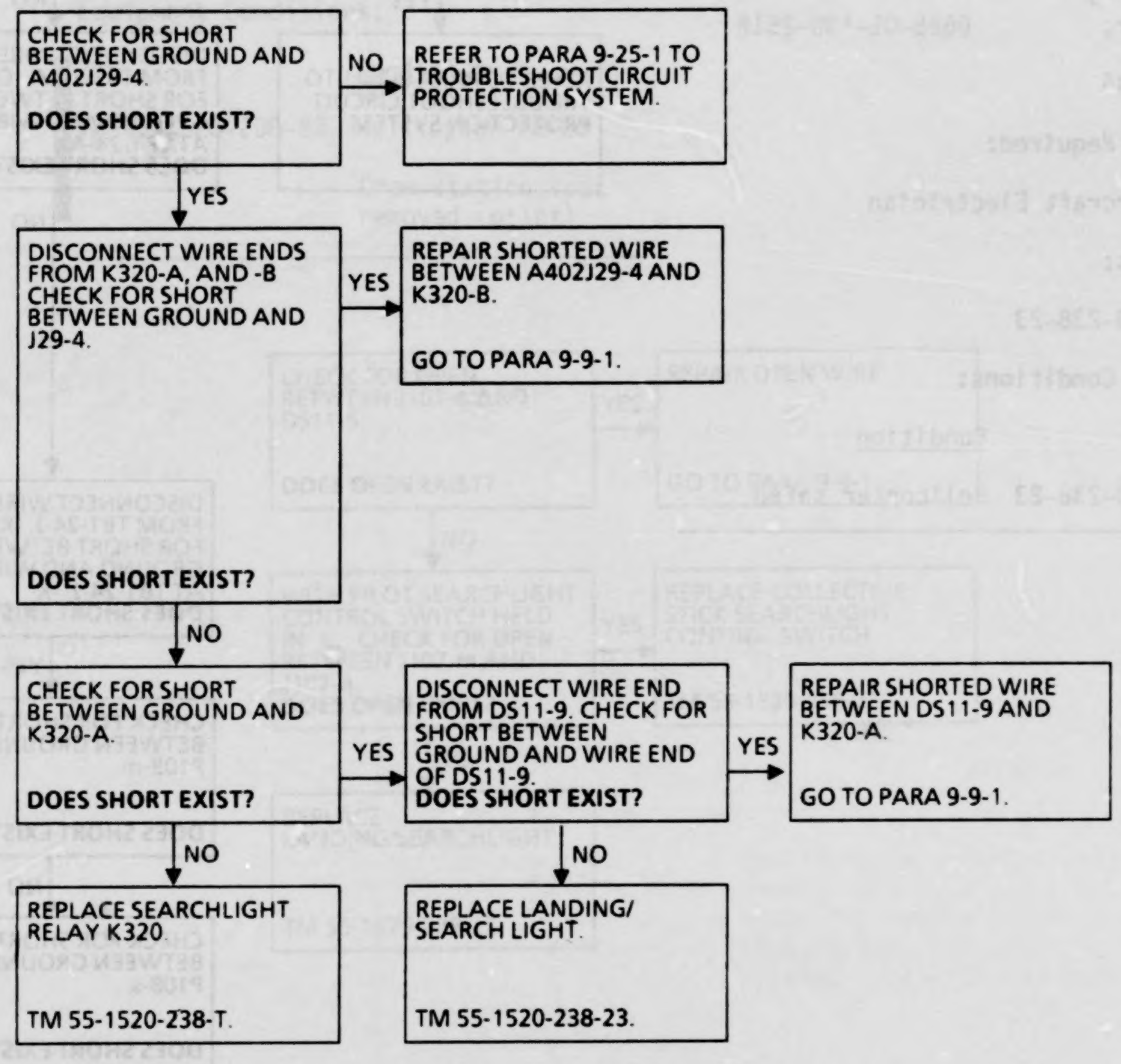
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


LT SRCH/LDG CIRCUIT BREAKER
LT SRCH/LDG CONTR CIRCUIT BREAKER
FIRE DETR
ENG INST
ENG 1
ENG 2
APU
LT
SRCH/LDG
SRCH/LDG CONTR
CAUT
UTIL SEC
ADF
IFF
KY 58
10
5
25

PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1220


CHECK FOR SHORT BETWEEN GROUND AND A402J29-4.
DOES SHORT EXIST?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
DISCONNECT WIRE ENDS FROM K320-A, AND -B CHECK FOR SHORT BETWEEN GROUND AND J29-4.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN A402J29-4 AND K320-B.
GO TO PARA 9-9-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND K320-A.
DOES SHORT EXIST?
YES
DISCONNECT WIRE END FROM DS11-9. CHECK FOR SHORT BETWEEN GROUND AND WIRE END OF DS11-9.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN DS11-9 AND K320-A.
GO TO PARA 9-9-1.
NO
REPLACE SEARCHLIGHT RELAY K320.
TM 55-1520-238-T.
NO
REPLACE LANDING/ SEARCH LIGHT.
TM 55-1520-238-23.

END OF TASK

9-9-5. LT SRCH/LDG CONTR CIRCUIT BREAKER (CB80) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

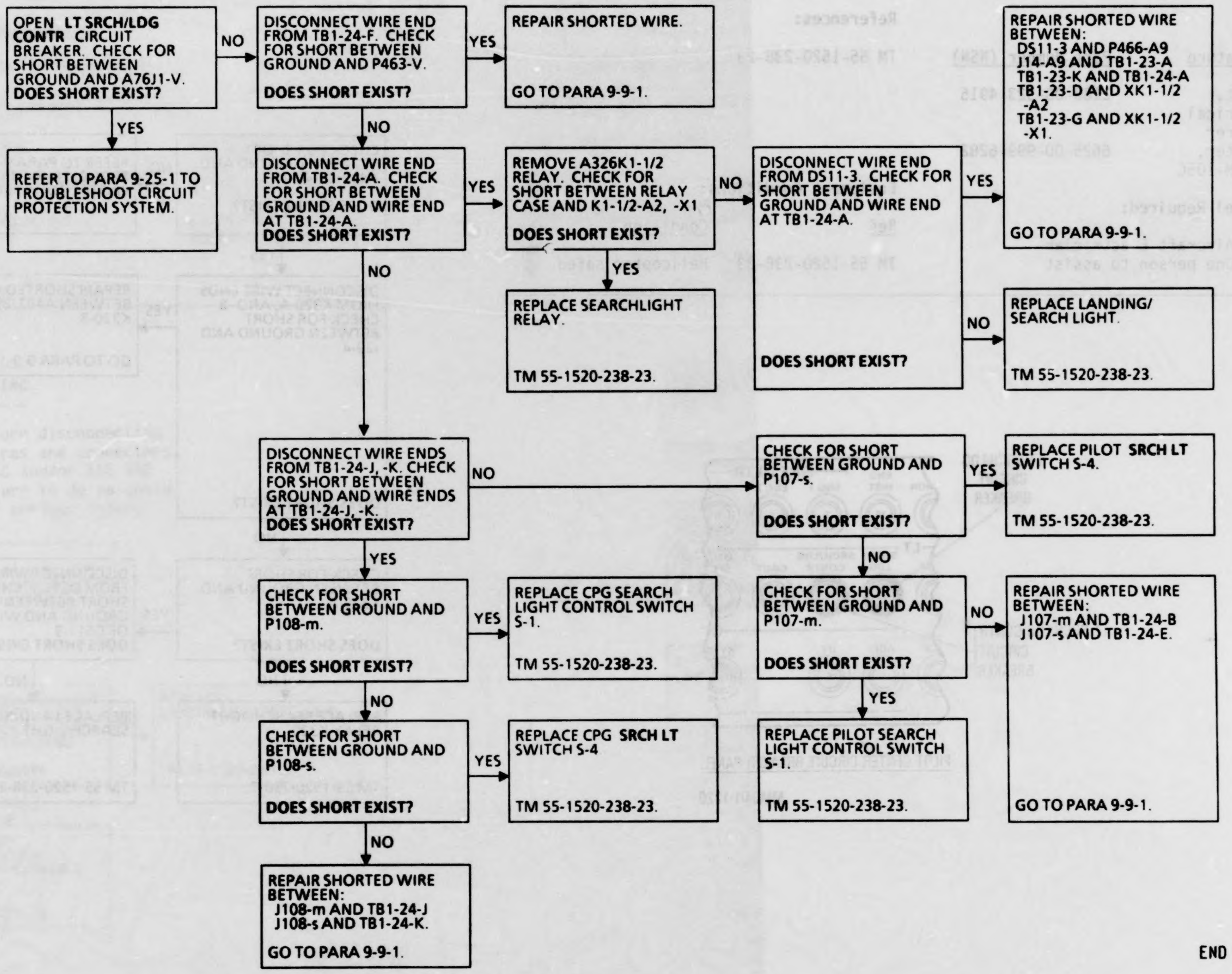
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN LT SRCH/LDG CONTR CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76J1-V. DOES SHORT EXIST?
NO
YES
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
DISCONNECT WIRE END FROM TB1-24-F. CHECK FOR SHORT BETWEEN GROUND AND P463-V. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-9-1.
NO
DISCONNECT WIRE END FROM TB1-24-A. CHECK FOR SHORT BETWEEN GROUND AND WIRE END AT TB1-24-A. DOES SHORT EXIST?
YES
REMOVE A326K1-1/2 RELAY. CHECK FOR SHORT BETWEEN RELAY CASE AND K1-1/2-A2, -X1 DOES SHORT EXIST?
YES
REPLACE SEARCHLIGHT RELAY. TM 55-1520-238-23.
NO
DISCONNECT WIRE END FROM DS11-3. CHECK FOR SHORT BETWEEN GROUND AND WIRE END AT TB1-24-A. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: DS11-3 AND P466-A9 J14-A9 AND TB1-23-A TB1-23-K AND TB1-24-A TB1-23-D AND XK1-1/2 -A2 TB1-23-G AND XK1-1/2 -X1. GO TO PARA 9-9-1.
NO
REPLACE LANDING/ SEARCH LIGHT. TM 55-1520-238-23.
NO
DISCONNECT WIRE ENDS FROM TB1-24-J, -K. CHECK FOR SHORT BETWEEN GROUND AND WIRE ENDS AT TB1-24-J, -K. DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN GROUND AND P107-s. DOES SHORT EXIST?
YES
REPLACE PILOT SRCH LT SWITCH S-4. TM 55-1520-238-23.
NO
CHECK FOR SHORT BETWEEN GROUND AND P107-m. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN: J107-m AND TB1-24-B J107-s AND TB1-24-E. GO TO PARA 9-9-1.
YES
REPLACE PILOT SEARCH LIGHT CONTROL SWITCH S-1. TM 55-1520-238-23.
YES
CHECK FOR SHORT BETWEEN GROUND AND P108-m. DOES SHORT EXIST?
YES
REPLACE CPG SEARCH LIGHT CONTROL SWITCH S-1. TM 55-1520-238-23.
NO
CHECK FOR SHORT BETWEEN GROUND AND P108-s. DOES SHORT EXIST?
YES
REPLACE CPG SRCH LT SWITCH S-4 TM 55-1520-238-23.
NO
REPAIR SHORTED WIRE BETWEEN: J108-m AND TB1-24-J J108-s AND TB1-24-K. GO TO PARA 9-9-1.

END OF TASK

9-9-6. PILOT COLLECTIVE STICK - DOES NOT EXTEND LANDING/SEARCH LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

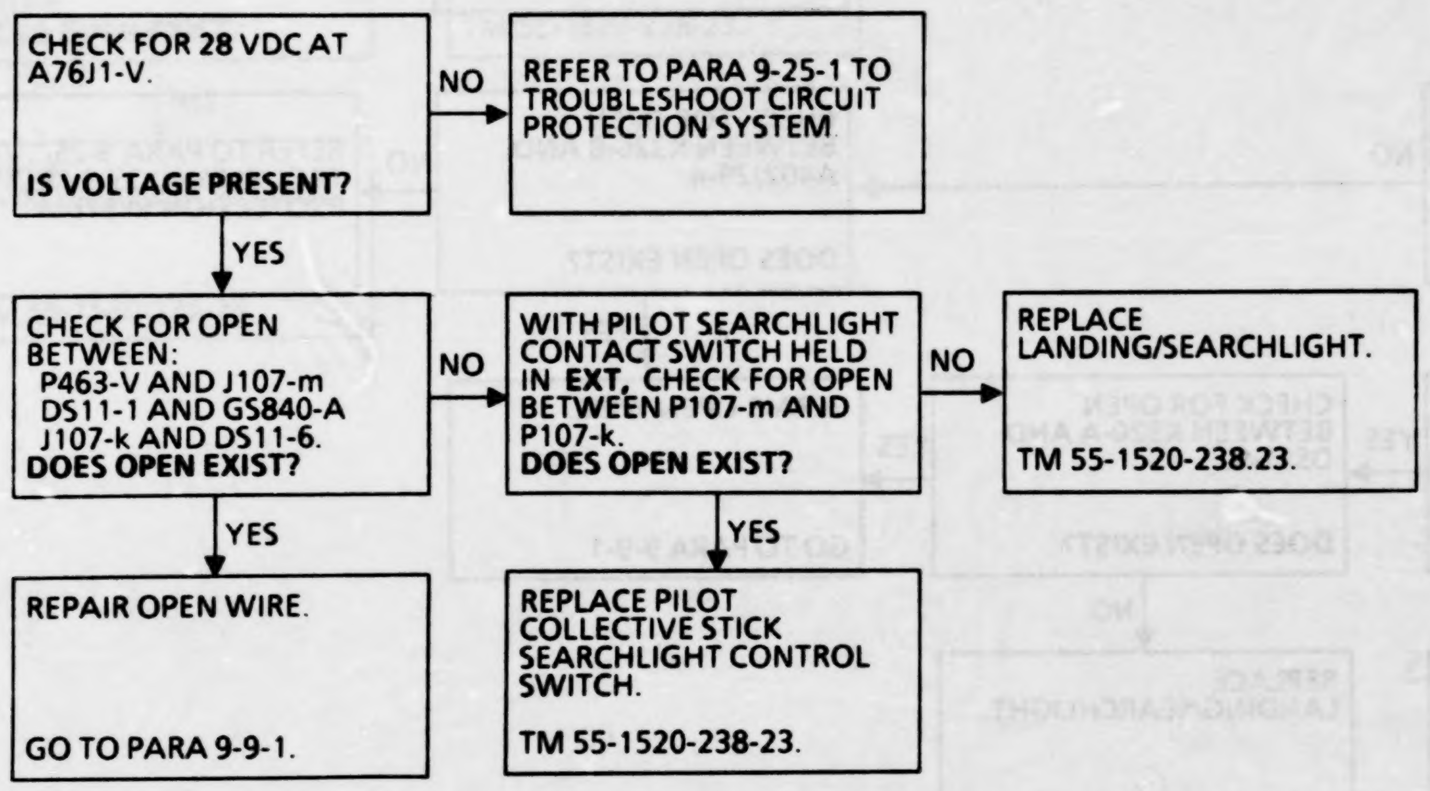
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT A76J1-V.
IS VOLTAGE PRESENT?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM
YES
CHECK FOR OPEN BETWEEN:
P463-V AND J107-m
DS11-1 AND GS840-A
J107-k AND DS11-6.
DOES OPEN EXIST?
NO
WITH PILOT SEARCHLIGHT CONTACT SWITCH HELD IN EXT, CHECK FOR OPEN BETWEEN P107-m AND P107-k.
DOES OPEN EXIST?
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238.23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
YES
REPLACE PILOT COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.
TM 55-1520-238-23.

END OF TASK

9-9-7. PILOT COLLECTIVE STICK - DOES NOT ROTATE LANDING/SEARCH LIGHT TO THE LEFT

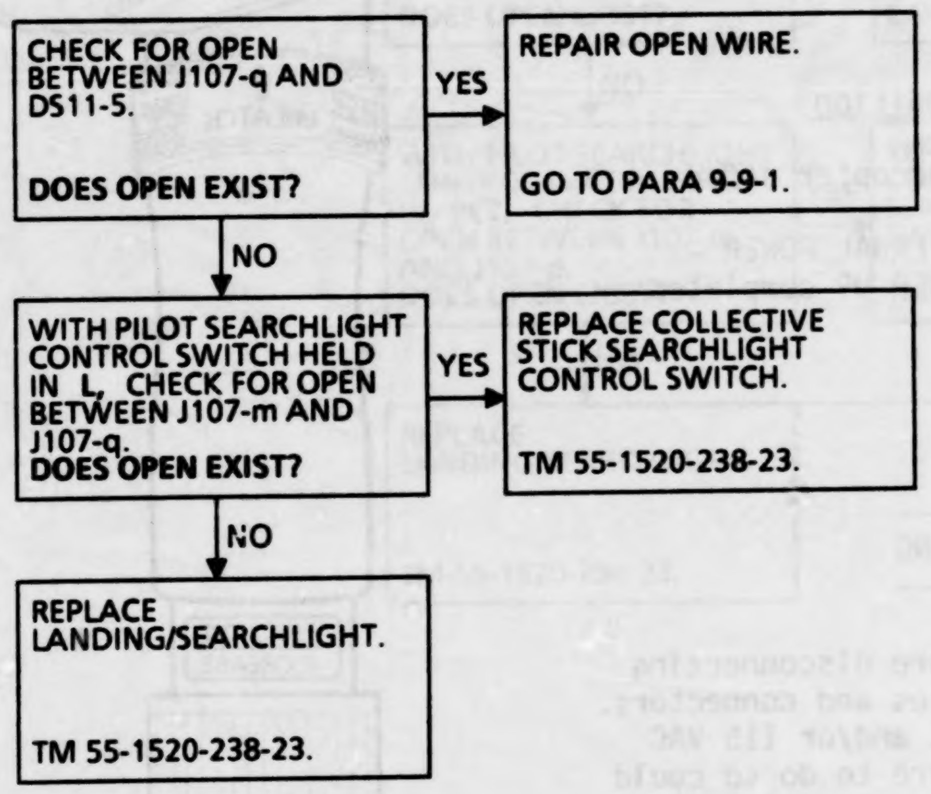
Tools: (para 9-9-6)

Personnel Required: (para 9-9-6)

References: (para 9-9-6)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Crew station seat removed (pilot)


CHECK FOR OPEN BETWEEN J107-q AND DS11-5.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
NO
WITH PILOT SEARCHLIGHT CONTROL SWITCH HELD IN L, CHECK FOR OPEN BETWEEN J107-m AND J107-q.
DOES OPEN EXIST?
YES
REPLACE COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.
TM 55-1520-238-23.
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.

END OF TASK

9-9-8. PILOT COLLECTIVE STICK - DOES NOT ACTIVATE LANDING/SEARCH LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

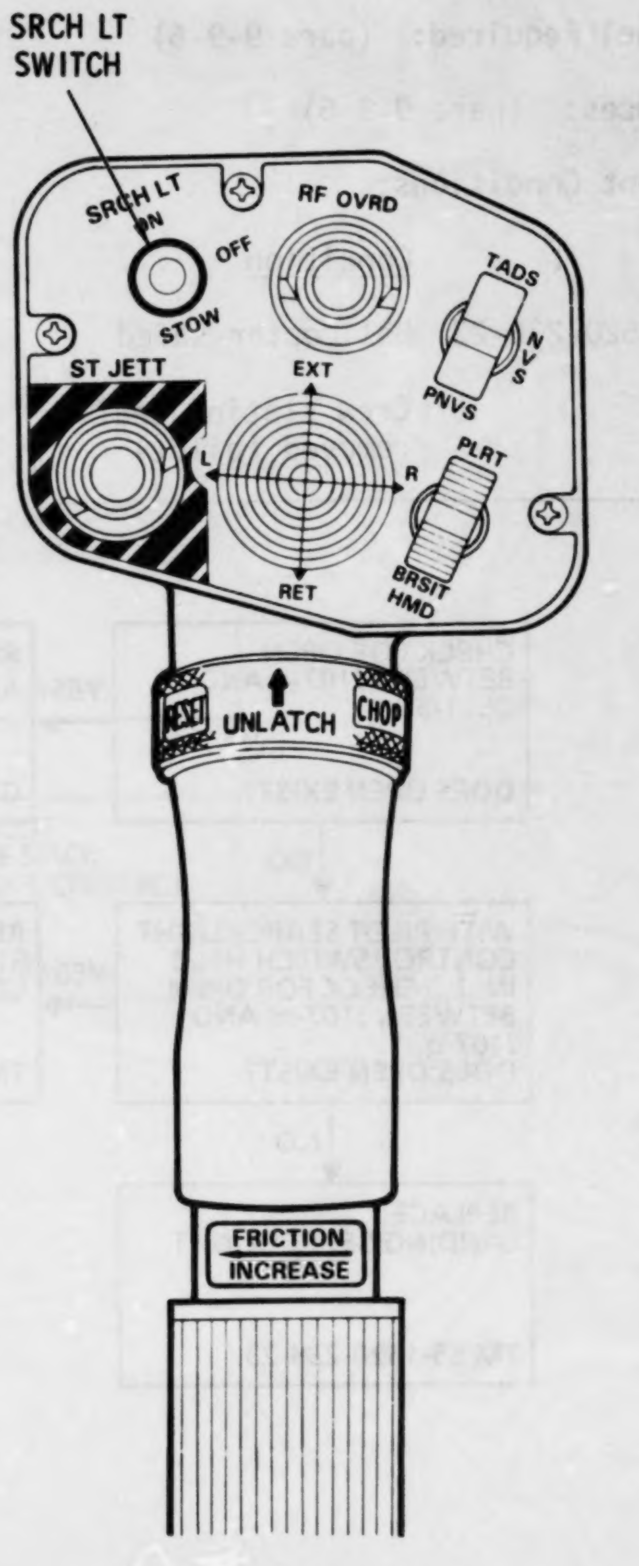
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

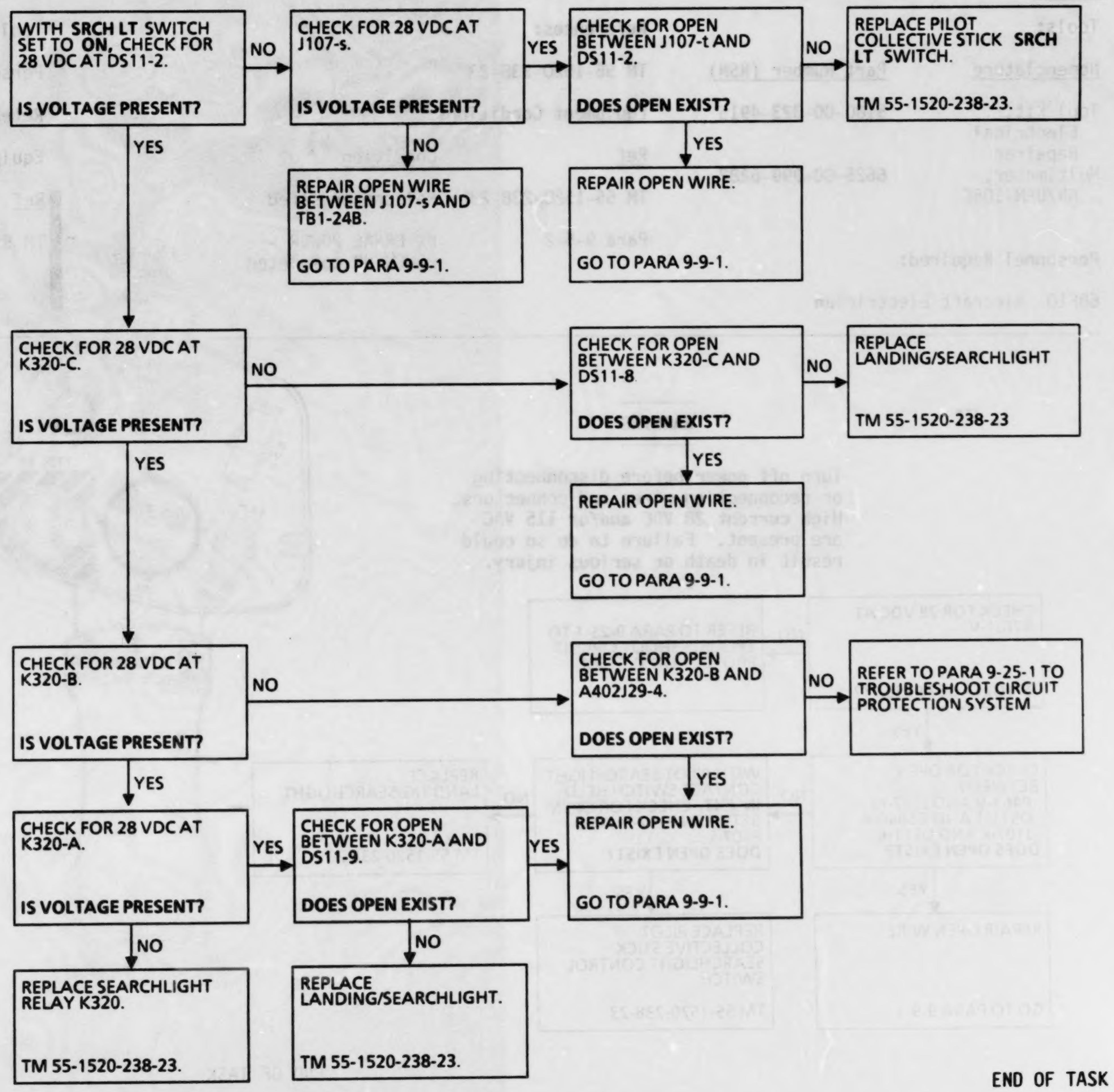
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



SRCH LT SWITCH
SRCH LT ON
OFF
STOW
RF OVRD
TADS
NVS
PNVS
ST JETT
EXT
R
RET
PLRT
BRSIT HMD
RESET
UNLATCH
CHOP
FRICTION INCREASE

PILOT COLLECTIVE STICK

MM04/1-1222A



WITH SRCH LT SWITCH SET TO ON, CHECK FOR 28 VDC AT DS11-2.
IS VOLTAGE PRESENT?
NO
CHECK FOR 28 VDC AT J107-s.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN J107-t AND DS11-2.
DOES OPEN EXIST?
NO
REPLACE PILOT COLLECTIVE STICK SRCH LT SWITCH.
TM 55-1520-238-23.
NO
REPAIR OPEN WIRE BETWEEN J107-s AND TB1-24B.
GO TO PARA 9-9-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
YES
CHECK FOR 28 VDC AT K320-C.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN K320-C AND DS11-8.
DOES OPEN EXIST?
NO
REPLACE LANDING/SEARCHLIGHT
TM 55-1520-238-23
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
YES
CHECK FOR 28 VDC AT K320-B.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN K320-B AND A402J29-4.
DOES OPEN EXIST?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
YES
CHECK FOR 28 VDC AT K320-A.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN K320-A AND DS11-9.
DOES OPEN EXIST?
YES
NO
REPLACE SEARCHLIGHT RELAY K320.
TM 55-1520-238-23.
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.

END OF TASK

9-9-9. PILOT COLLECTIVE STICK - DOES NOT ROTATE LANDING/SEARCH LIGHT TO THE RIGHT

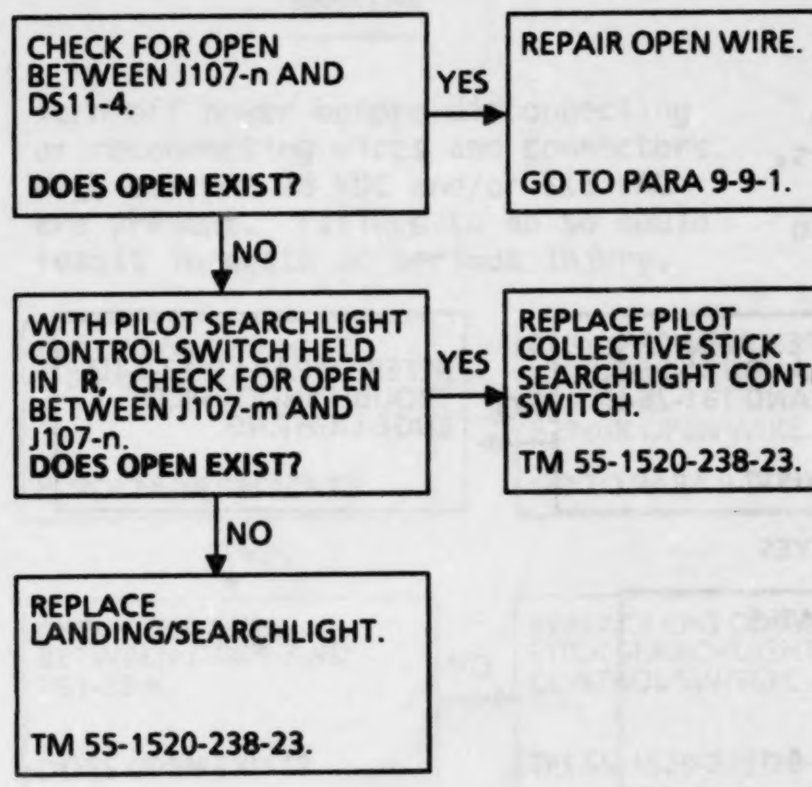
Tools: (para 9-9-8)

Personnel Required: (para 9-9-8)

References: (para 9-9-8)

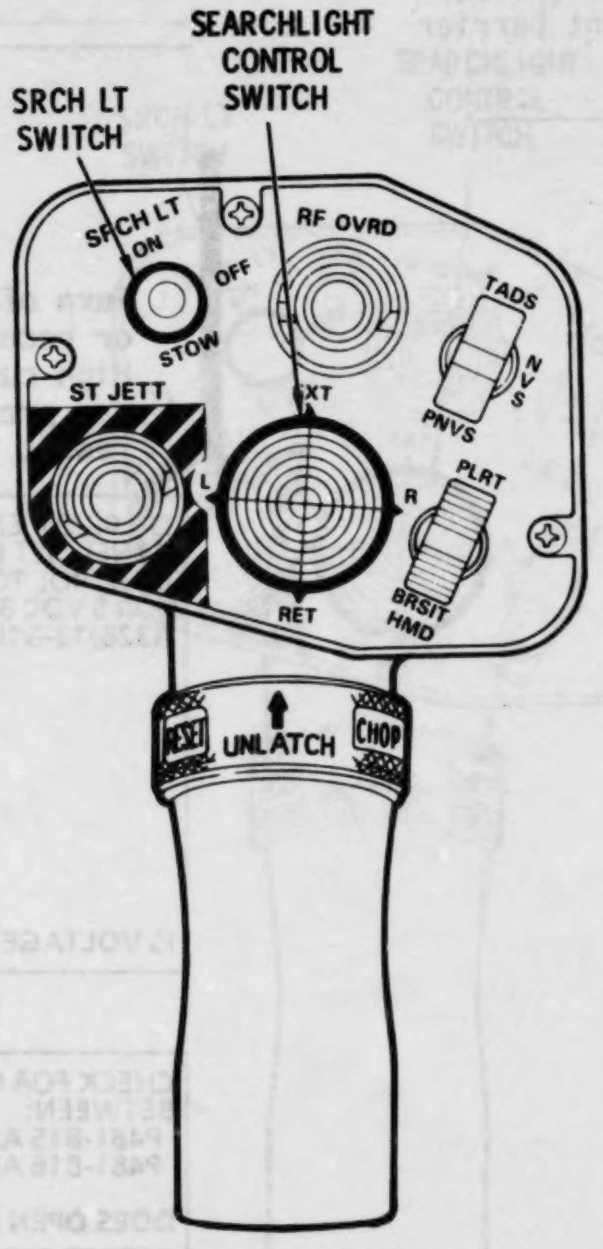
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat removed (pilot)



CHECK FOR OPEN BETWEEN J107-n AND DS11-4.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
NO
WITH PILOT SEARCHLIGHT CONTROL SWITCH HELD IN R, CHECK FOR OPEN BETWEEN J107-m AND J107-n.
DOES OPEN EXIST?
YES
REPLACE PILOT COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.
TM 55-1520-238-23.
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.

END OF TASK



SEARCHLIGHT CONTROL SWITCH
SRCH LT SWITCH
SRCH LT
ON
OFF
STOW
RF OVRD
TADS
NVS
PNVS
ST JETT
EXT
L
R
RET
PLRT
BRSIT HMD
RESET
UNLATCH
CHOP

PILOT COLLECTIVE STICK

MM04/1-1223A

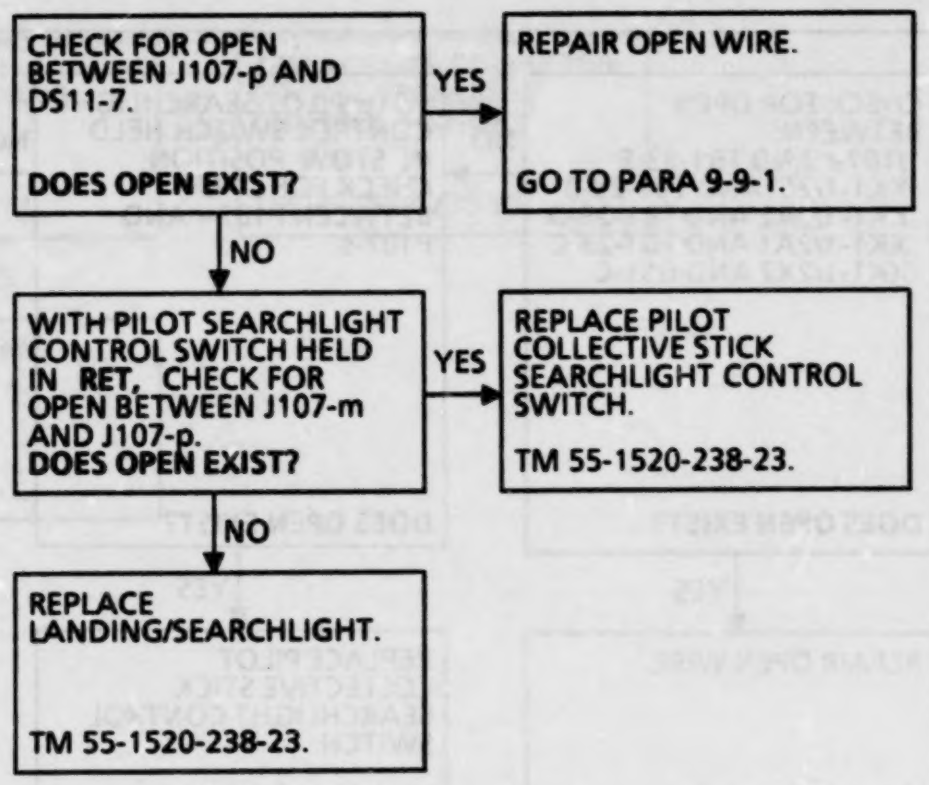
9-9-10. PILOT COLLECTIVE STICK - DOES NOT RETRACT LANDING/SEARCH LIGHT

Tools: (para 9-9-8)

Personnel Required: (para 9-9-8)

References: (para 9-9-8)

Equipment Conditions: (para 9-9-9)



CHECK FOR OPEN BETWEEN J107-p AND DS11-7.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
NO
WITH PILOT SEARCHLIGHT CONTROL SWITCH HELD IN RET, CHECK FOR OPEN BETWEEN J107-m AND J107-p.
DOES OPEN EXIST?
YES
REPLACE PILOT COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.
TM 55-1520-238-23.
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.

END OF TASK

9-9-11. PILOT COLLECTIVE STICK - DOES NOT STOW LANDING/SEARCH LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

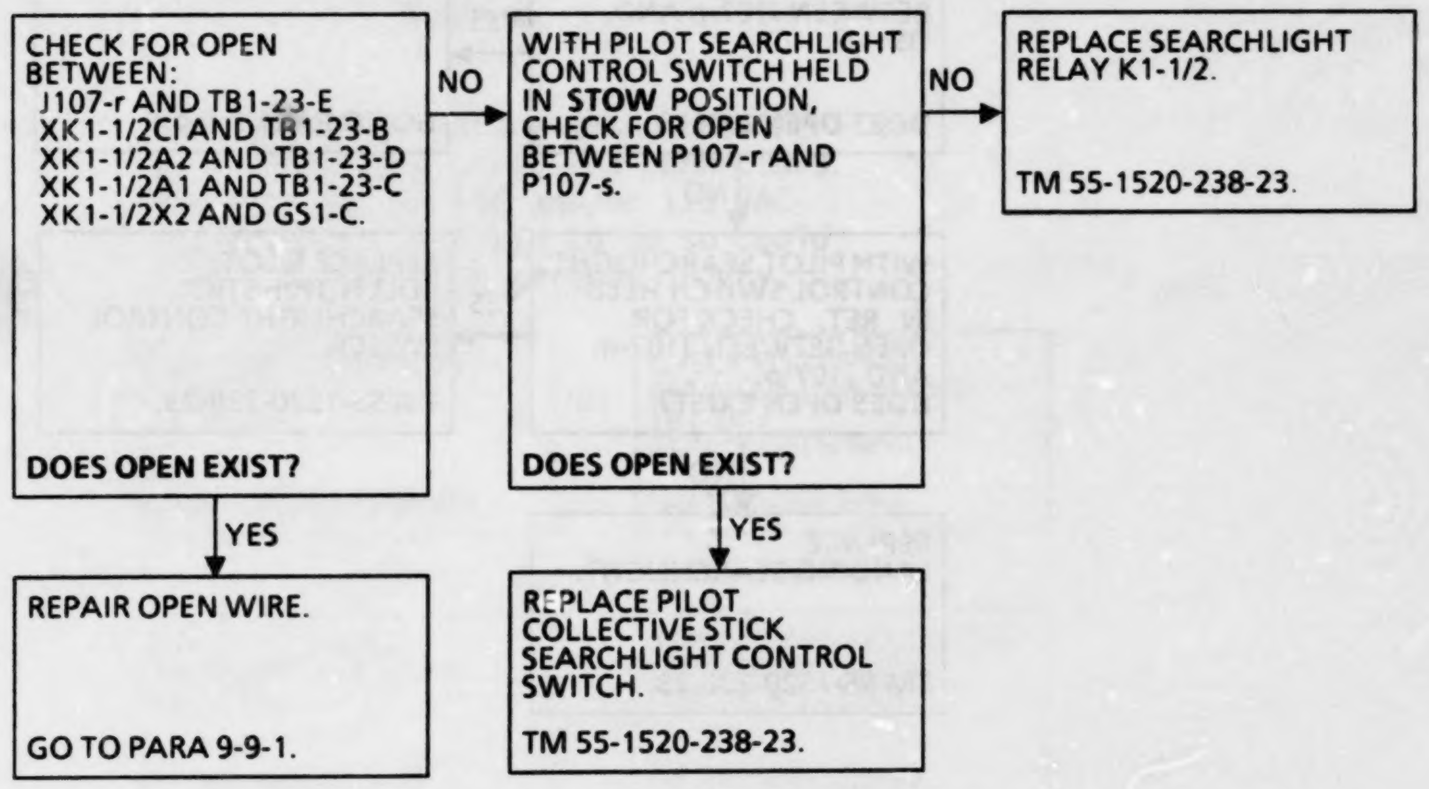
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat (pilot) and nontransparent barrier removed


CHECK FOR OPEN BETWEEN: J107-r AND TB1-23-E XK1-1/2CI AND TB1-23-B XK1-1/2A2 AND TB1-23-D XK1-1/2A1 AND TB1-23-C XK1-1/2X2 AND GS1-C. DOES OPEN EXIST?
NO
WITH PILOT SEARCHLIGHT CONTROL SWITCH HELD IN STOW POSITION, CHECK FOR OPEN BETWEEN P107-r AND P107-s. DOES OPEN EXIST?
NO
REPLACE SEARCHLIGHT RELAY K1-1/2. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-9-1.
YES
REPLACE PILOT COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH. TM 55-1520-238-23.

END OF TASK

9-9-12. PILOT COLLECTIVE STICK EDGE-LIGHT - IS NOT LIGHTED

Tools: (para 9-9-11)

Personnel Required: (para 9-9-11)

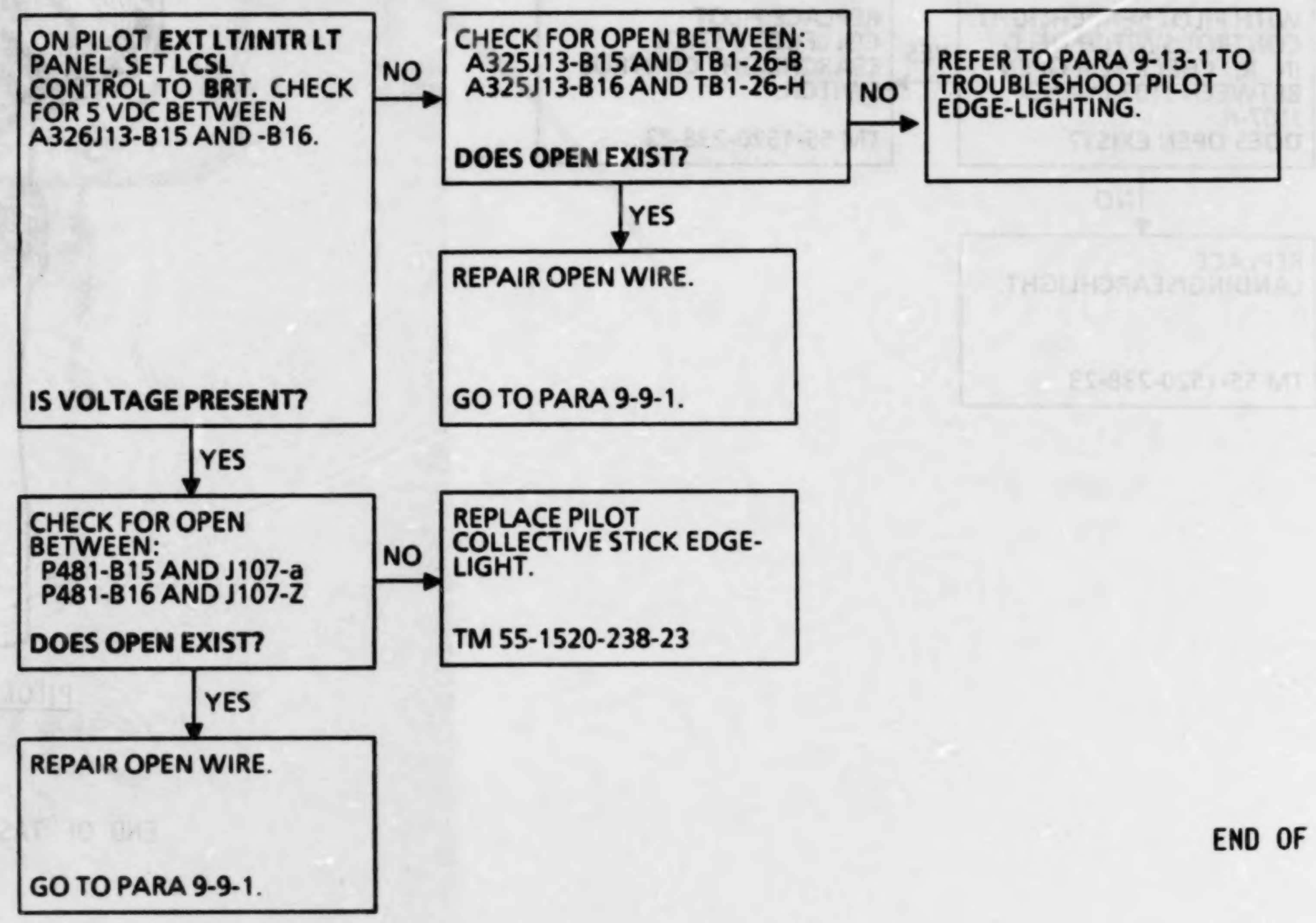
References: (para 9-9-11)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
Para 9-5-2	EXTERNAL POWER POWER UP - completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON PILOT EXT LT/INTR LT PANEL, SET LCSL CONTROL TO BRT. CHECK FOR 5 VDC BETWEEN A326J13-B15 AND -B16. IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN: A325J13-B15 AND TB1-26-B A325J13-B16 AND TB1-26-H DOES OPEN EXIST?
NO
REFER TO PARA 9-13-1 TO TROUBLESHOOT PILOT EDGE-LIGHTING.
YES
REPAIR OPEN WIRE. GO TO PARA 9-9-1.
YES
CHECK FOR OPEN BETWEEN: P481-B15 AND J107-a P481-B16 AND J107-Z DOES OPEN EXIST?
NO
REPLACE PILOT COLLECTIVE STICK EDGE-LIGHT. TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-9-1.

END OF TASK

9-9-13. CPG COLLECTIVE STICK - DOES NOT EXTEND LANDING/SEARCH LIGHT

Tools: (para 9-9-11)

Personnel Required: (para 9-9-11)

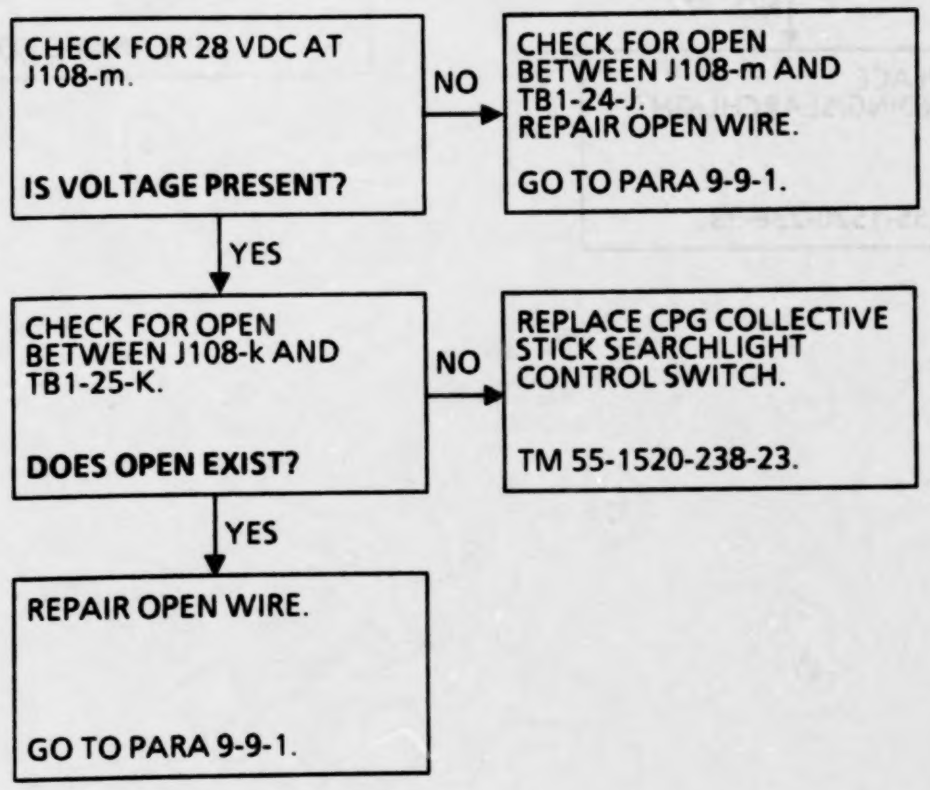
References: (para 9-9-11)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat removed (cpg)
Para 9-5-2	EXTERNAL POWER - POWER UP competed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 28 VDC AT J108-m.

IS VOLTAGE PRESENT?

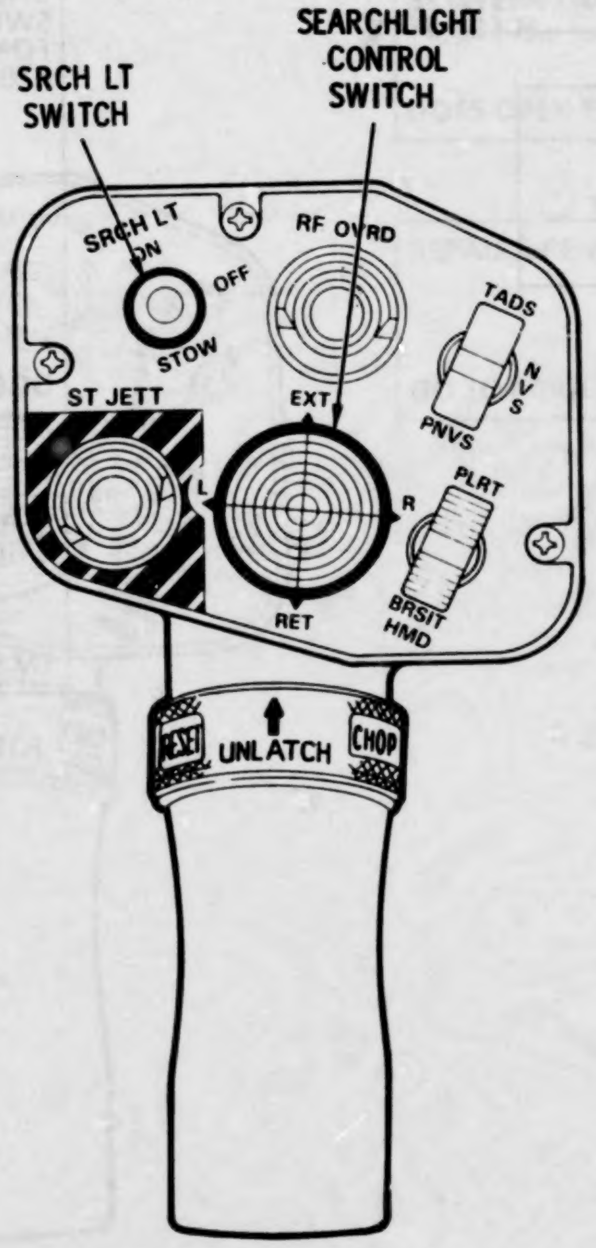
NO: CHECK FOR OPEN BETWEEN J108-m AND TB1-24-J. REPAIR OPEN WIRE. GO TO PARA 9-9-1.

YES: CHECK FOR OPEN BETWEEN J108-k AND TB1-25-K.

DOES OPEN EXIST?

NO: REPLACE CPG COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH. TM 55-1520-238-23.

YES: REPAIR OPEN WIRE. GO TO PARA 9-9-1.


SRCH LT SWITCH
SEARCHLIGHT CONTROL SWITCH
SRCH LT
ON
OFF
STOW
RF OVRD
TADS
NVS
PNVS
ST JETT
EXT
L
R
RET
PLRT
BRSIT HMD
RESET
UNLATCH
CHOP
MM0[illegible]1-1224A

CPG COLLECTIVE STICK

END OF TASK

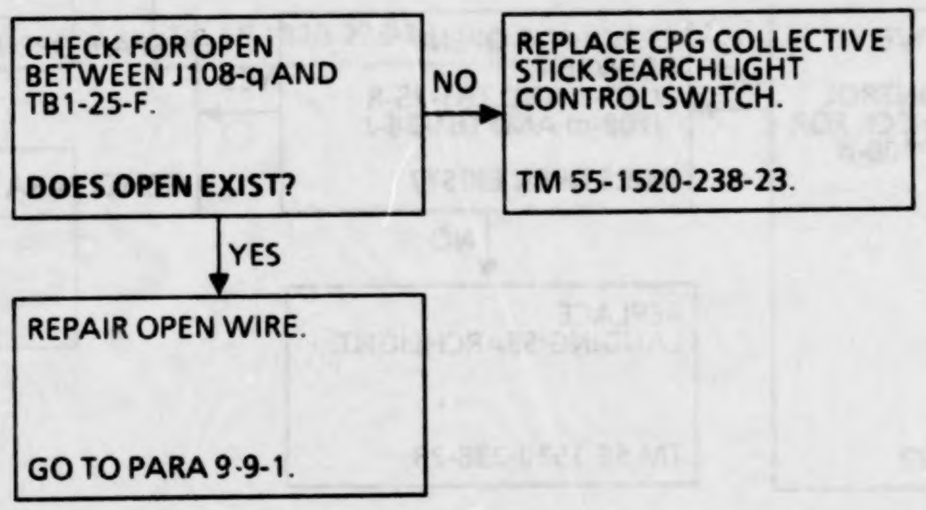
9-9-14. CPG COLLECTIVE STICK - DOES NOT ROTATE LANDING/SEARCH LIGHT TO LEFT

Tools: (para 9-9-11)

Personnel Required: (para 9-9-11)

References: (para 9-9-11)

Equipment Conditions: (para 9-9-13)



CHECK FOR OPEN BETWEEN J108-q AND TB1-25-F.

DOES OPEN EXIST?

NO: REPLACE CPG COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH. TM 55-1520-238-23.

YES: REPAIR OPEN WIRE. GO TO PARA 9-9-1.

END OF TASK

9-9-15. CPG COLLECTIVE STICK - DOES NOT ROTATE LANDING/SEARCH LIGHT TO THE RIGHT

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

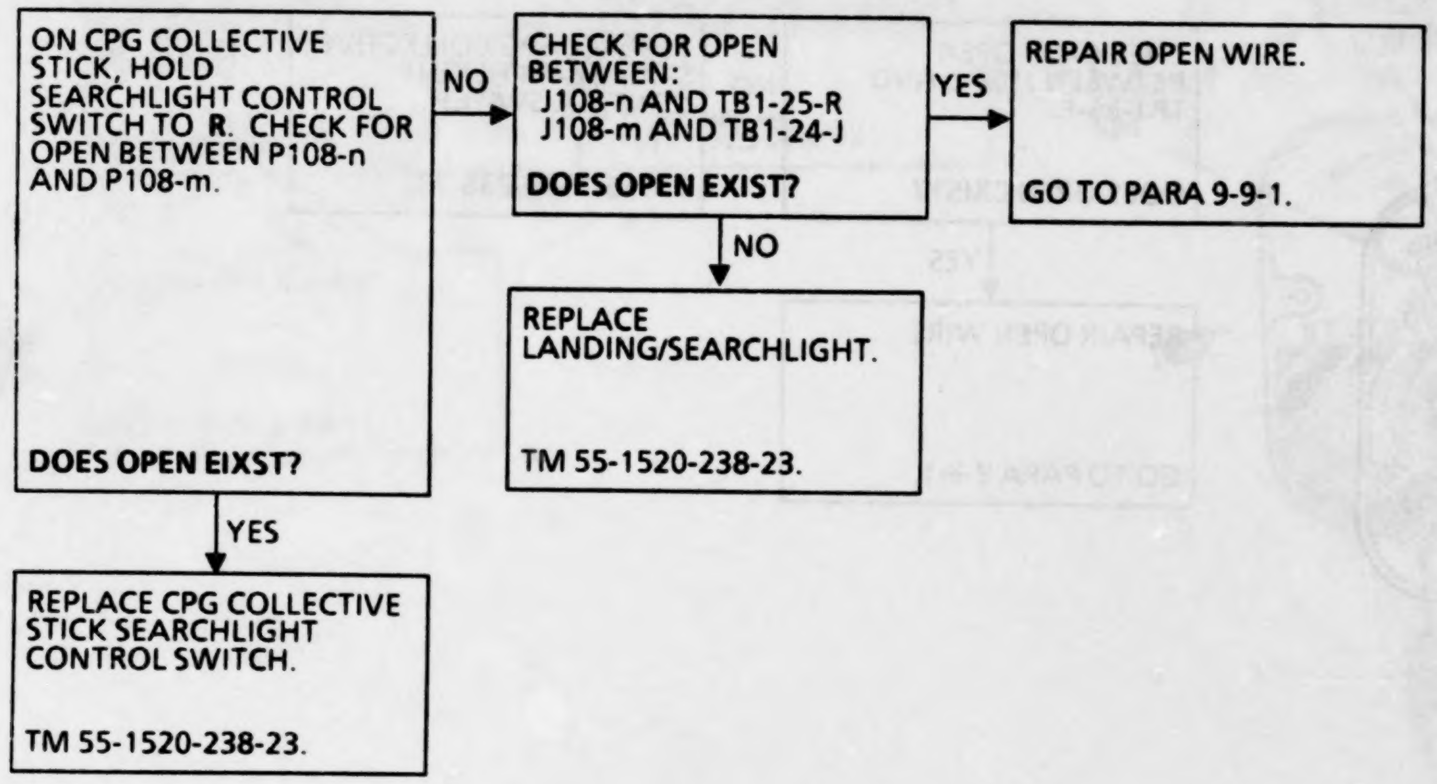
68F10	Aircraft Electrician One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat removed (cpg)


ON CPG COLLECTIVE STICK, HOLD SEARCHLIGHT CONTROL SWITCH TO R. CHECK FOR OPEN BETWEEN P108-n AND P108-m.
DOES OPEN EIXST?
NO
CHECK FOR OPEN BETWEEN:
J108-n AND TB1-25-R
J108-m AND TB1-24-J
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.
YES
REPLACE CPG COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.
TM 55-1520-238-23.

END OF TASK

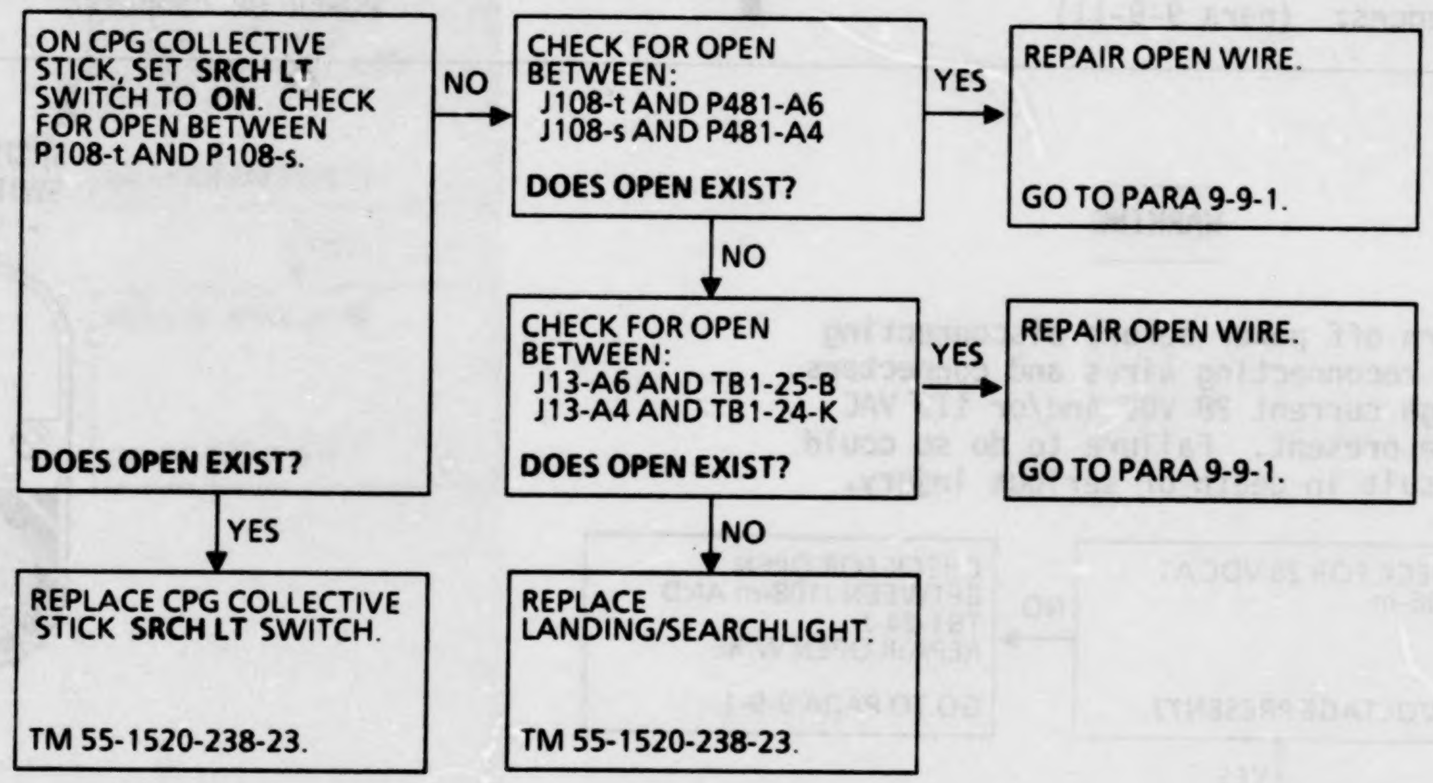
9-9-16. CPG COLLECTIVE STICK - DOES NOT ACTIVATE LANDING/SEARCH LIGHT

Tools: (para 9-9-15)

Personnel Required: (para 9-9-15)

References: (para 9-9-15)

Equipment Conditions: (para 9-9-15)


ON CPG COLLECTIVE STICK, SET SRCH LT SWITCH TO ON. CHECK FOR OPEN BETWEEN P108-t AND P108-s.
DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN:
J108-t AND P481-A6
J108-s AND P481-A4
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
NO
CHECK FOR OPEN BETWEEN:
J13-A6 AND TB1-25-B
J13-A4 AND TB1-24-K
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.
YES
REPLACE CPG COLLECTIVE STICK SRCH LT SWITCH.
TM 55-1520-238-23.

END OF TASK

9-9-17. CPG COLLECTIVE STICK - DOES NOT RETRACT LANDING/SEARCH LIGHT

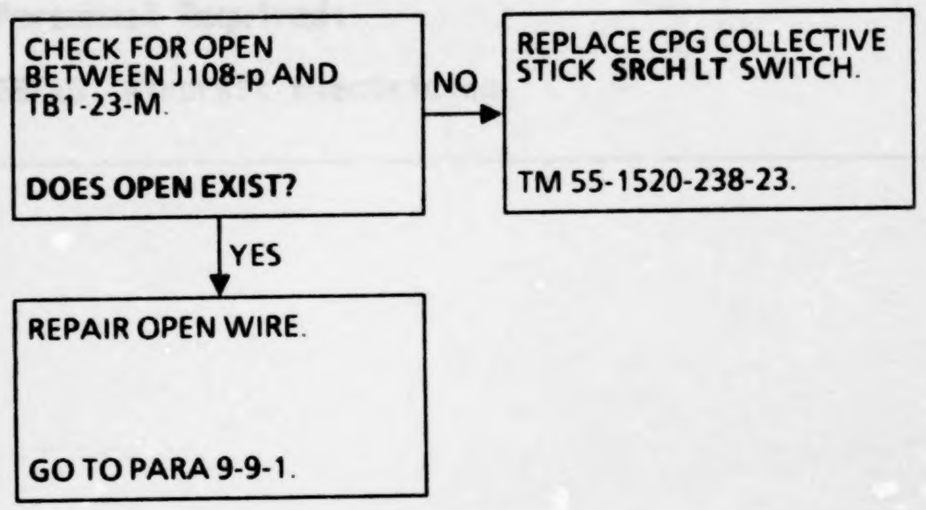
Tools: (para 9-9-15)

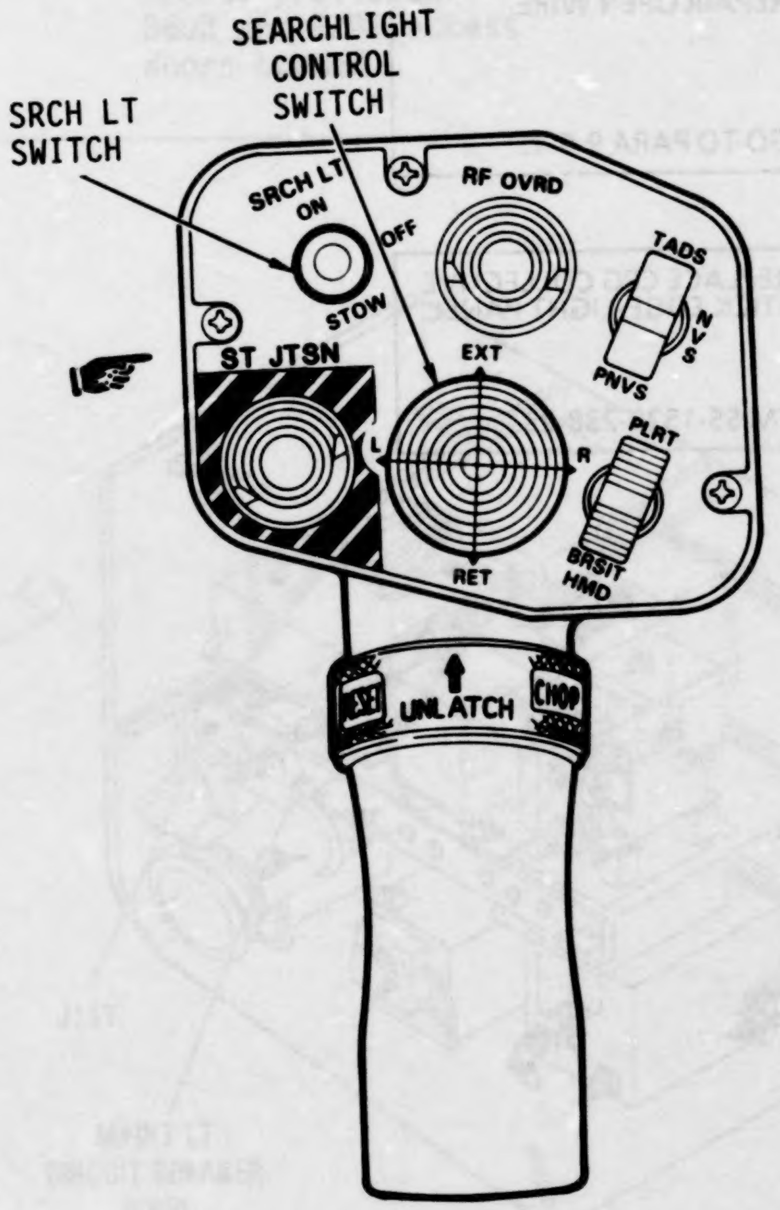
Personnel Required: (para 9-9-15)

References: (para 9-9-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat (CPG) and nonstransparent barrier removed


CHECK FOR OPEN BETWEEN J108-p AND TB1-23-M.
DOES OPEN EXIST?
NO
REPLACE CPG COLLECTIVE STICK SRCH LT SWITCH.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.


SEARCHLIGHT CONTROL SWITCH
SRCH LT SWITCH
SRCH LT
ON
OFF
STOW
RF OVRD
TADS
NVS
PNVS
ST JTSN
EXT
R
PLRT
BRSIT HMD
RET
UNLATCH
CHOP

PILOT COLLECTIVE STICK

M04/1-1225B

END OF TASK

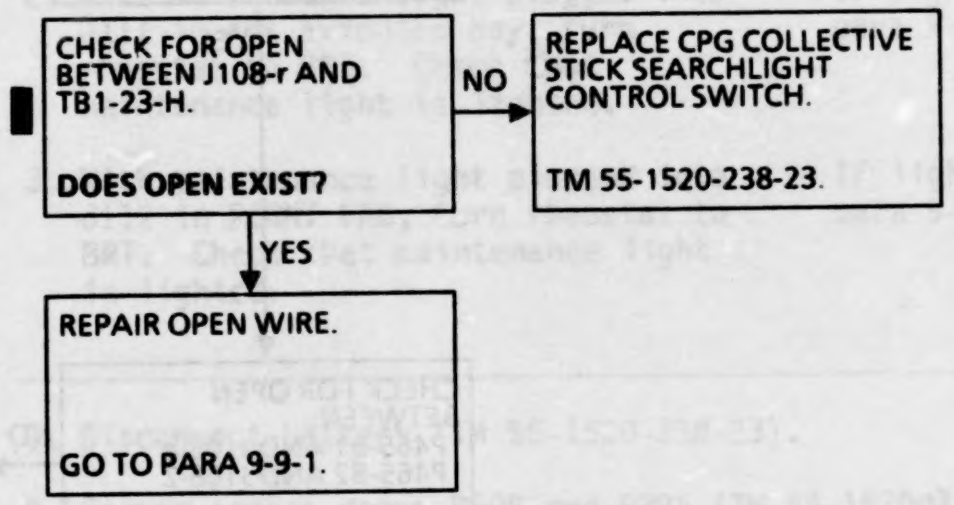
9-9-18. CPG COLLECTIVE STICK - DOES NOT STOW LANDING/SEARCH LIGHT

Tools: (para 9-9-15)

Personnel Required: (para 9-9-15)

References: (para 9-9-15)

Equipment Conditions: (para 9-9-17)


CHECK FOR OPEN BETWEEN J108-r AND TB1-23-H.
DOES OPEN EXIST?
NO
REPLACE CPG COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.

END OF TASK

9-9-19. CPG COLLECTIVE STICK EDGE-LIGHT - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

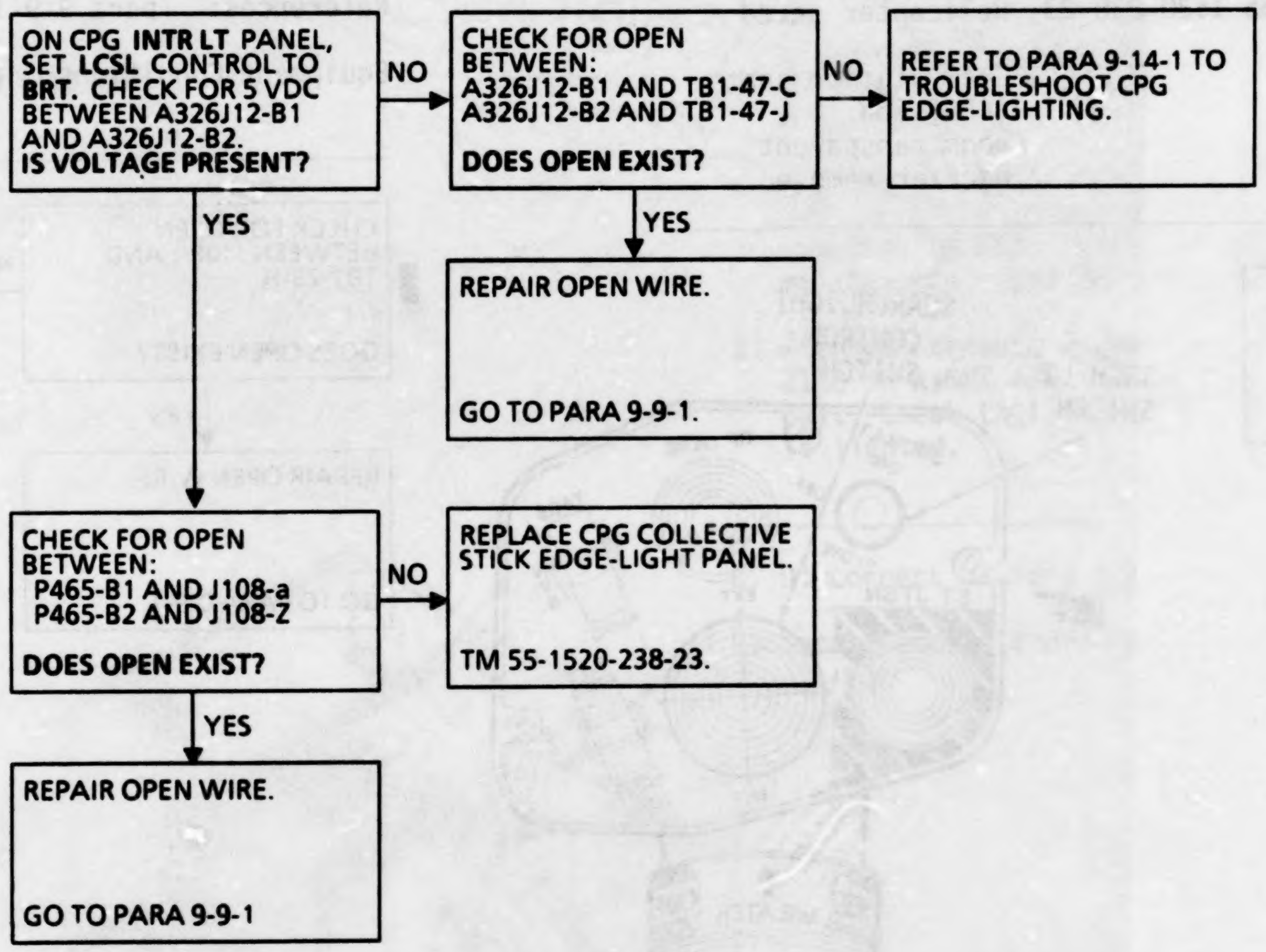
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
	Nontransparent barrier removed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON CPG **INTR LT** PANEL, SET **LCSL** CONTROL TO **BRT**. CHECK FOR 5 VDC BETWEEN A326J12-B1 AND A326J12-B2. IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN: A326J12-B1 AND TB1-47-C A326J12-B2 AND TB1-47-J DOES OPEN EXIST?

REFER TO PARA 9-14-1 TO TROUBLESHOOT CPG EDGE-LIGHTING.

REPAIR OPEN WIRE. GO TO PARA 9-9-1.

CHECK FOR OPEN BETWEEN: P465-B1 AND J108-a P465-B2 AND J108-Z DOES OPEN EXIST?

REPLACE CPG COLLECTIVE STICK EDGE-LIGHT PANEL. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-9-1

END OF TASK

9-10-1. MAINTENANCE LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282
Maintenance Light Assembly	7-116122072

Personnel Required:

68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - B60R and R295 access doors opened

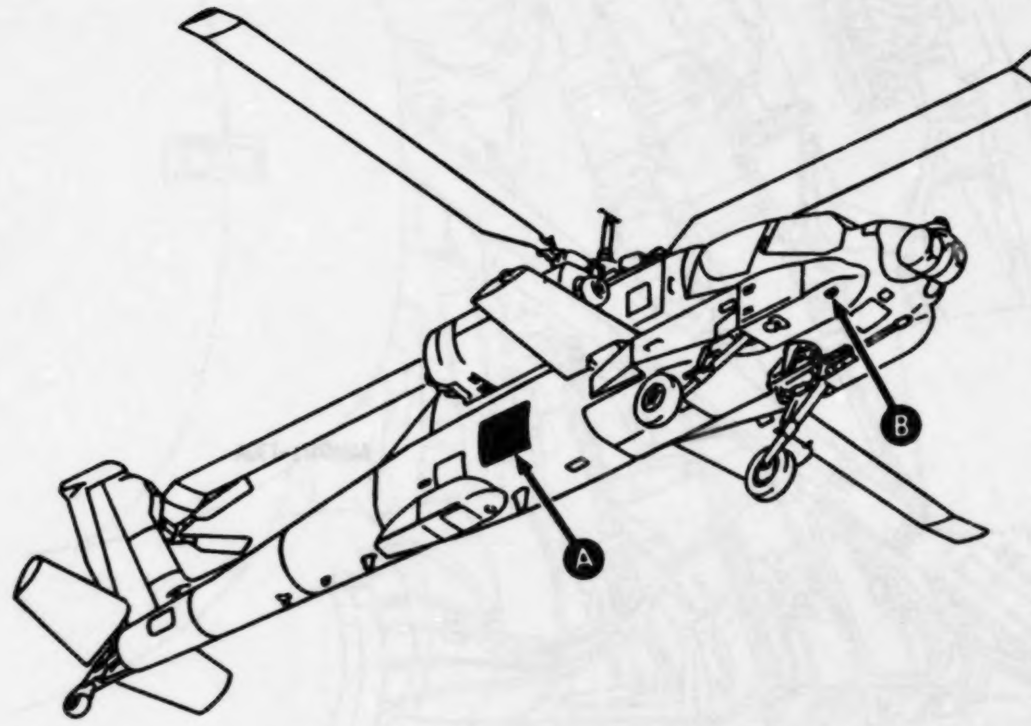
A. Connect battery (TM 55-1520-238-23).

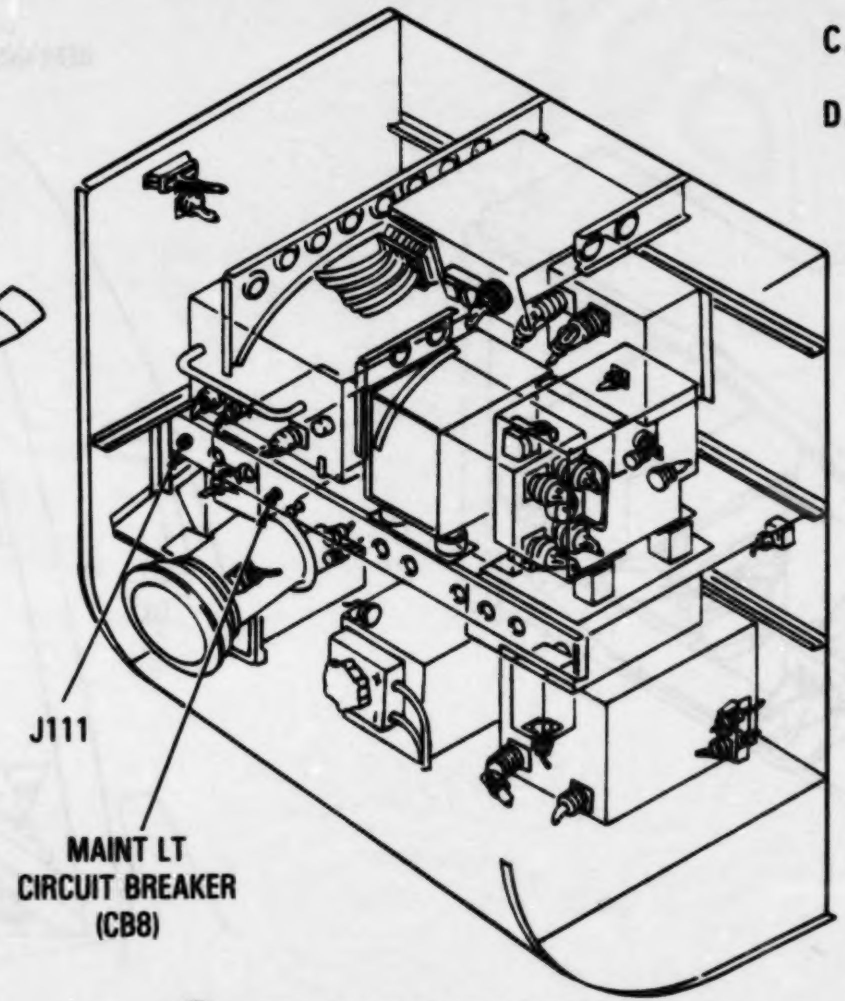
B. Complete operational check as follows:

TASK	RESULT
1. In aft avionics bay, check that MAINT LT (CB8) circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-10-4.
2. With maintenance light plugged into J111 in aft avionics bay, turn rheostat to BRT. Check that maintenance light is lighted.	If light is not lighted, go to para 9-10-5.
3. With maintenance light plugged into J112 in RIGHT FAB, turn rheostat to BRT. Check that maintenance light is lighted.	If light is not lighted, go to para 9-10-6.

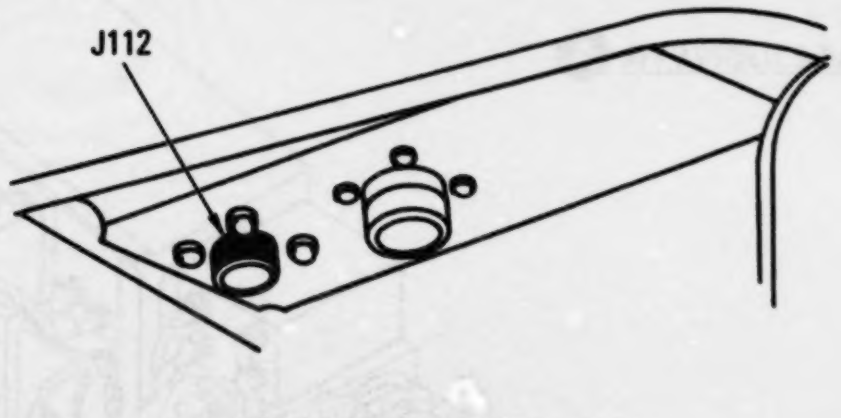
C. Disconnect battery (TM 55-1520-238-23).

D. Secure access doors B60R and R295 (TM 55-1520-238-23).

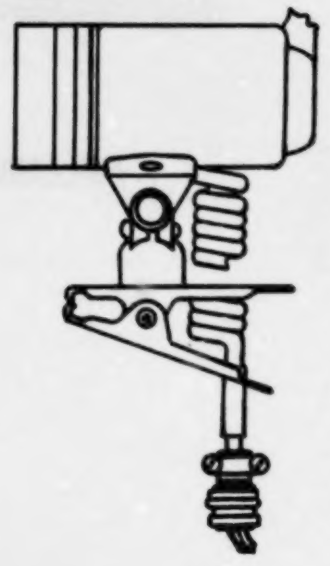




Ⓐ AFT AVIONICS BAY THRU R295



Ⓑ MAINTENANCE LIGHT JACK

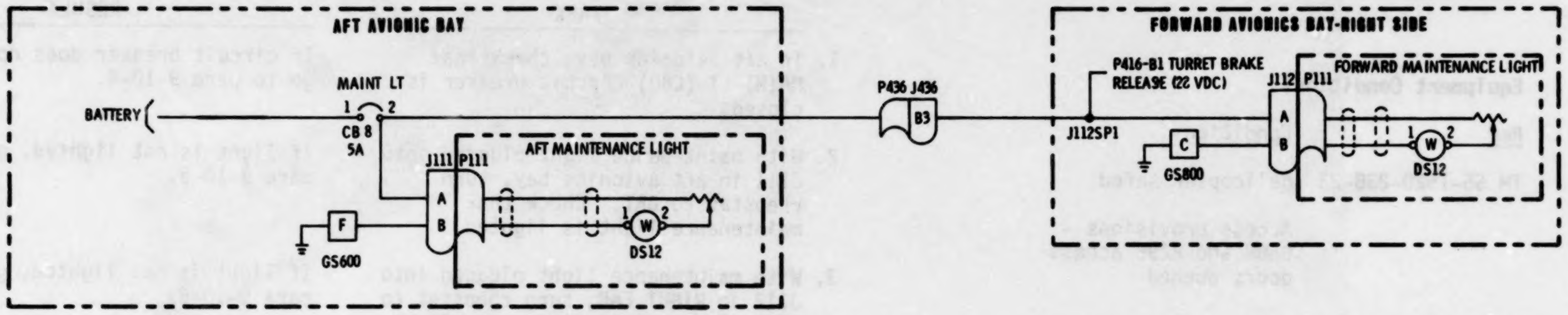


MAINTENANCE LIGHT

MM04/1-1024A

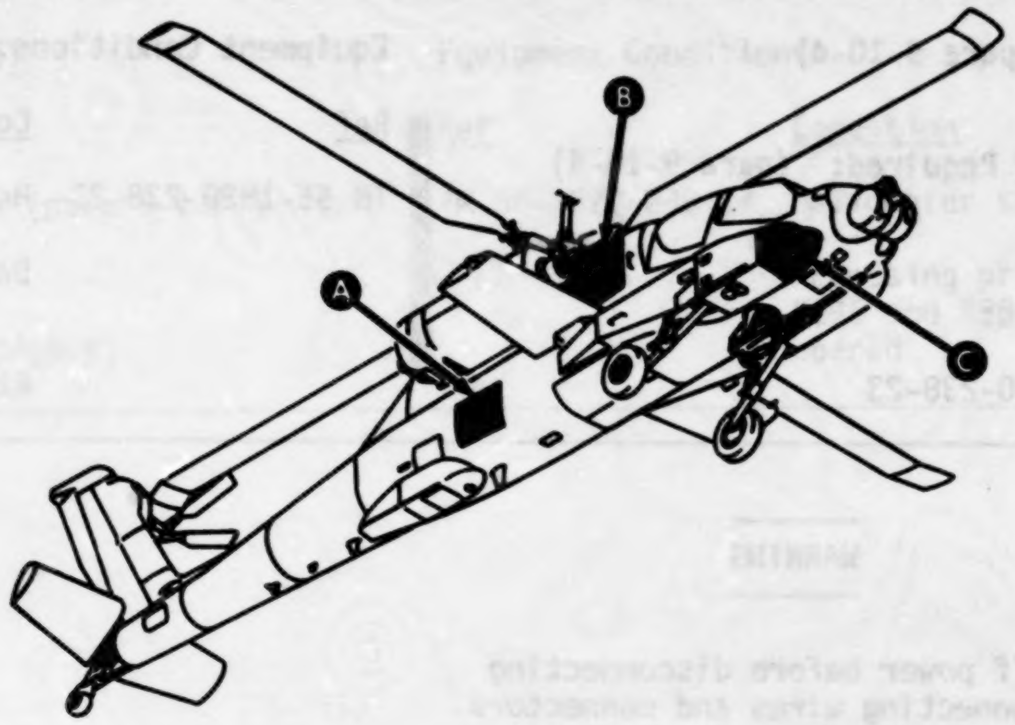
END OF TASK

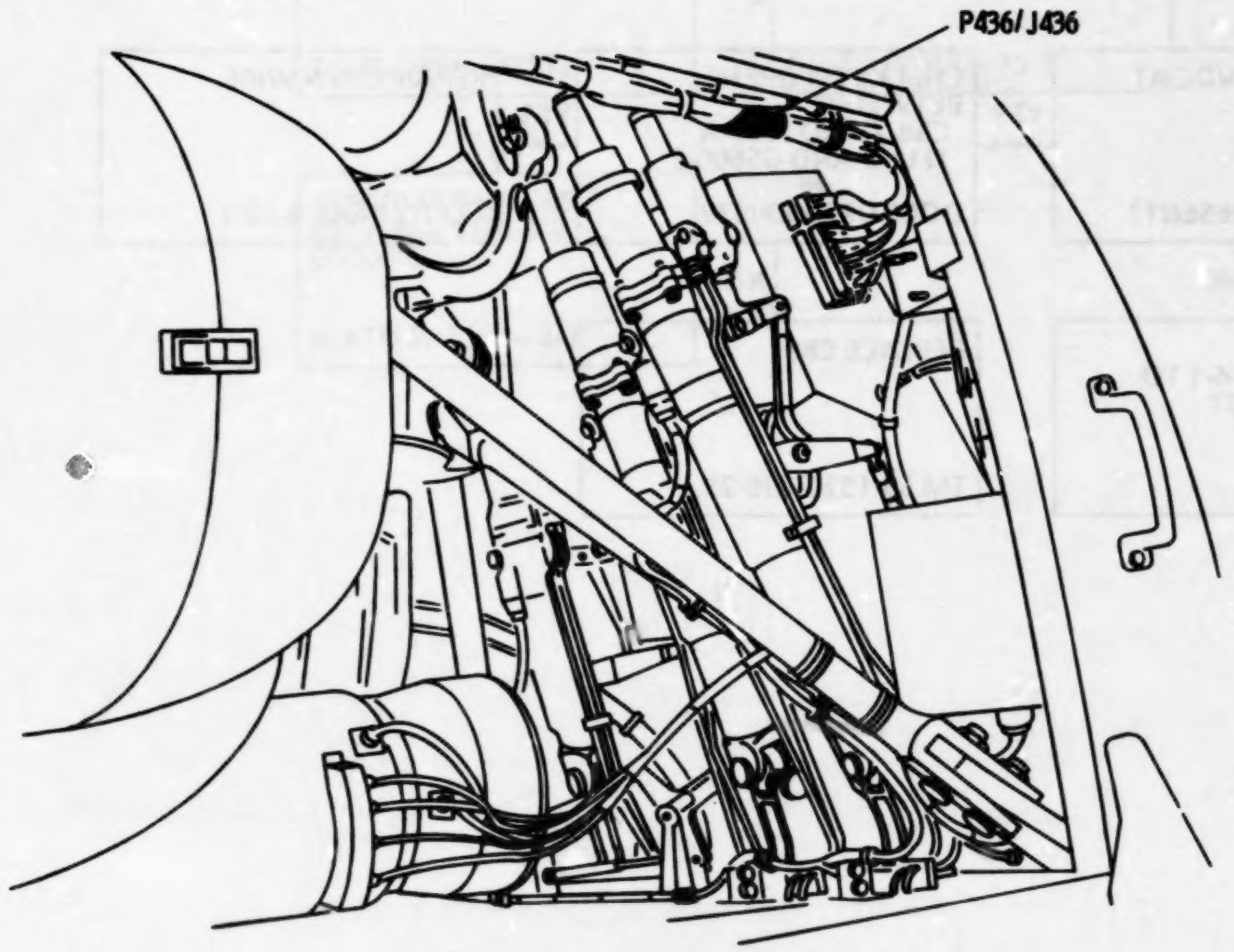
9-10-2. MAINTENANCE LIGHTS - INTERCONNECTION DIAGRAM


AFT AVIONIC BAY
MAINT LT
BATTERY
1
2
CB 8
5A
AFT MAINTENANCE LIGHT
J111
P111
A
B
F
GS600
1
W
2
DS12
P436
J436
B3
FORWARD AVIONICS BAY-RIGHT SIDE
P416-B1 TURRET BRAKE RELEASE (22 VDC)
J112
P111
FORWARD MAINTENANCE LIGHT
J112SP1
C
GS800
A
B
1
W
2
DS12

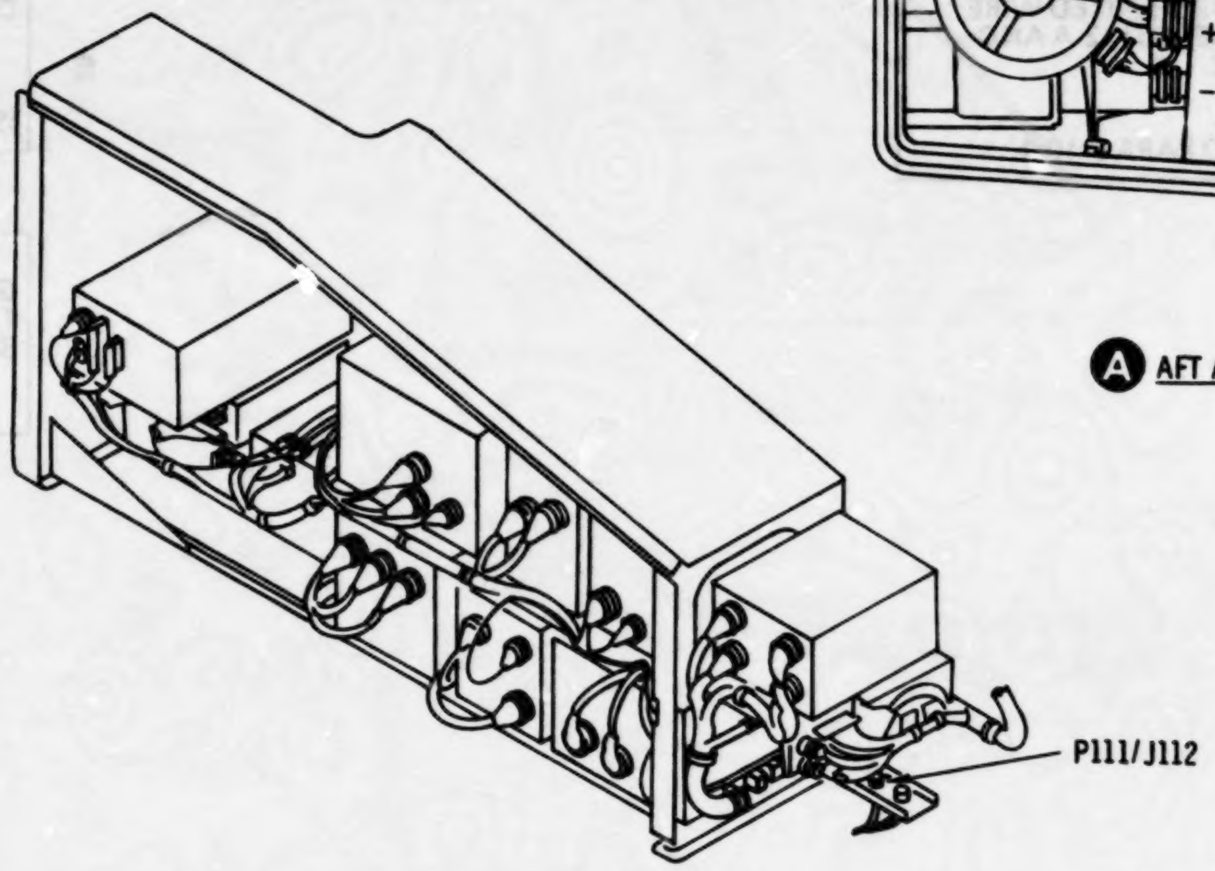
MM04/1-730A

9-10-3. MAINTENANCE LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURAITON

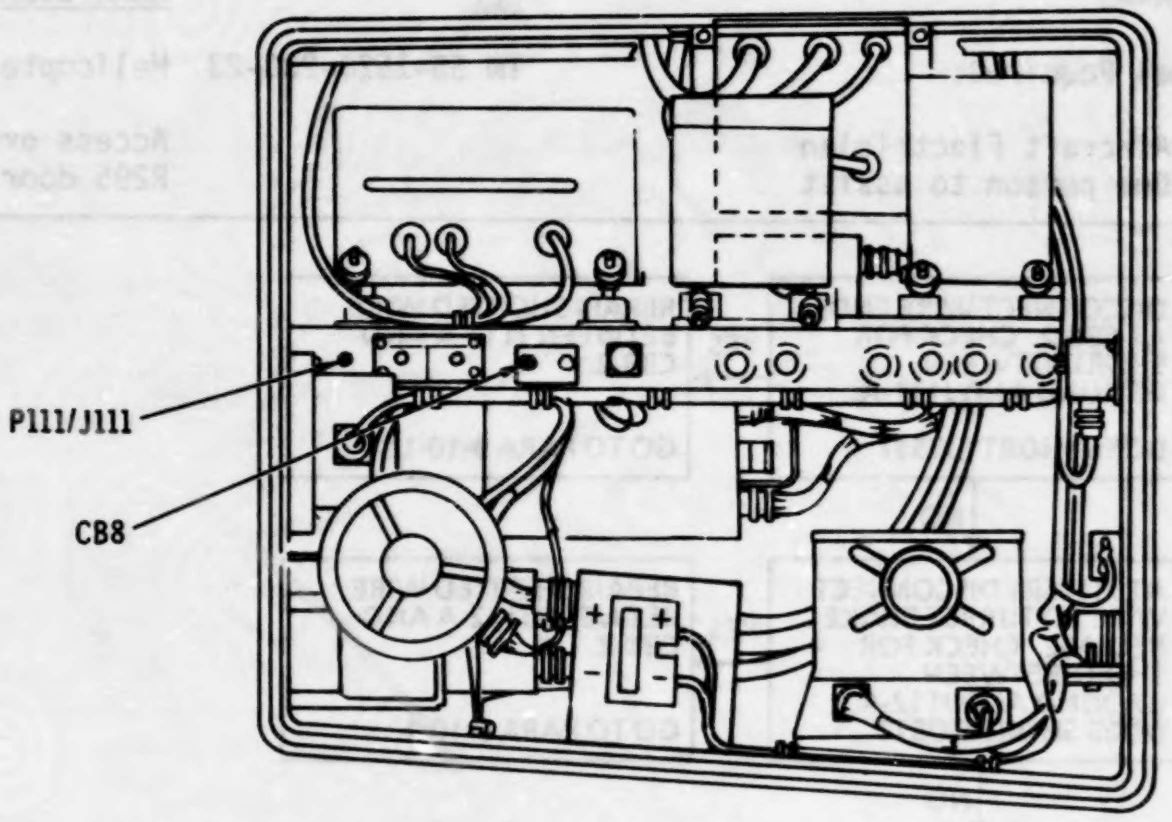




Ⓑ MAIN DECK THROUGH PANEL R200



Ⓒ RIGHT HAND FORWARD AVIONICS BAY THROUGH FAIRING R60


P111/J111
CB8

Ⓐ AFT AVIONICS BAY THROUGH DOOR R295

MM04/1-1226B

9-10-4. MAINT LT CIRCUIT BREAKER (CB8) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

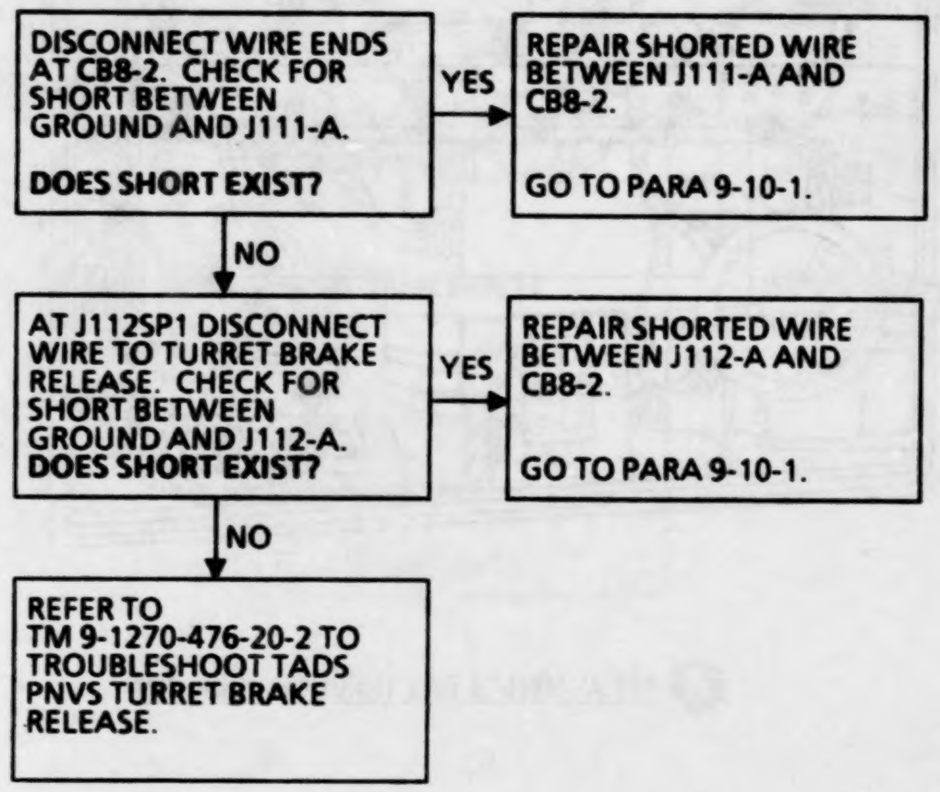
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23
TM 9-1270-476-20

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R295 door opened


DISCONNECT WIRE ENDS AT CB8-2. CHECK FOR SHORT BETWEEN GROUND AND J111-A.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN J111-A AND CB8-2.
GO TO PARA 9-10-1.
NO
AT J112SP1 DISCONNECT WIRE TO TURRET BRAKE RELEASE. CHECK FOR SHORT BETWEEN GROUND AND J112-A.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN J112-A AND CB8-2.
GO TO PARA 9-10-1.
NO
REFER TO TM 9-1270-476-20-2 TO TROUBLESHOOT TADS PNVS TURRET BRAKE RELEASE.

END OF TASK

Tools: (para 9-10-4)

Personnel Required: (para 9-10-4)

References:

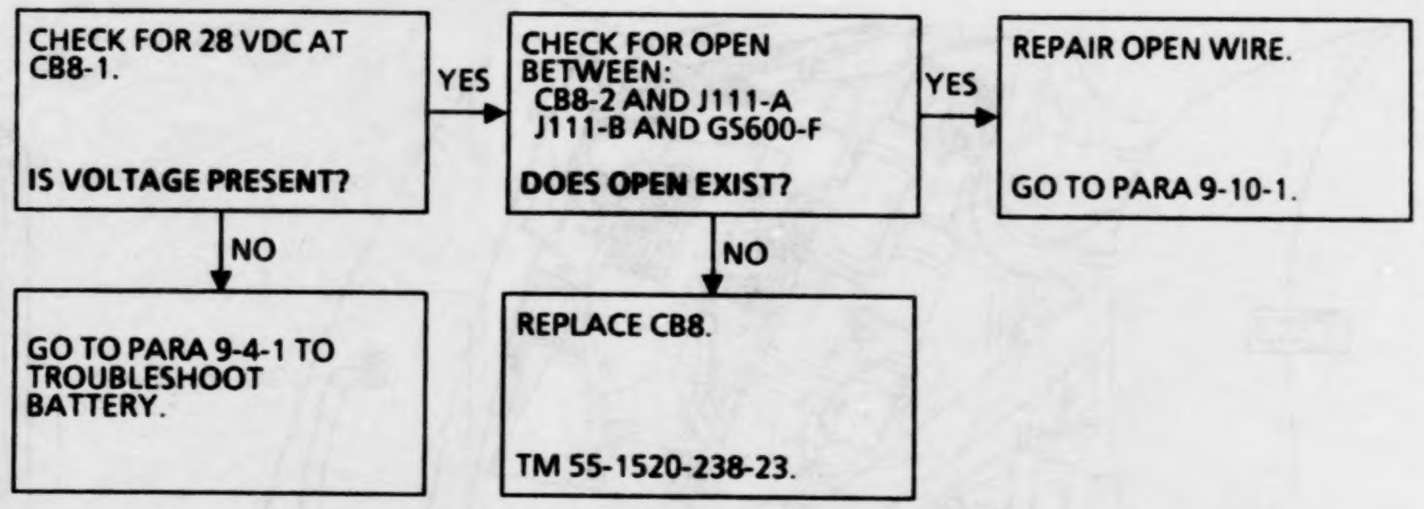
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Battery connected
	Access provisions - R295 door opened

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT CB8-1.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: CB8-2 AND J111-A J111-B AND GS600-F
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-10-1.
NO
GO TO PARA 9-4-1 TO TROUBLESHOOT BATTERY.
NO
REPLACE CB8.
TM 55-1520-238-23.

END OF TASK

9-10-6. MAINTENANCE LIGHT - DOES NOT OPERATE IN RIGHT FORWARD AVIONICS BAY

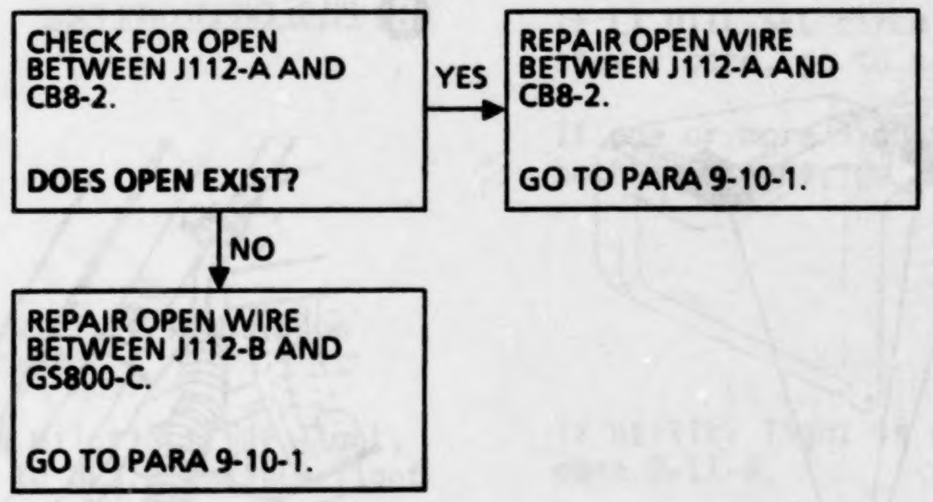
Tools: (para 9-10-4)

Personnel Required: (para 9-10-4)

References: (para 9-10-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Accessing provisions - R295 and R90 doors opened



CHECK FOR OPEN BETWEEN J112-A AND CB8-2.

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE BETWEEN J112-A AND CB8-2.

GO TO PARA 9-10-1.

NO: REPAIR OPEN WIRE BETWEEN J112-B AND GS800-C.

GO TO PARA 9-10-1.

END OF TASK

9-11-1. PILOT UTILITY AND SECONDARY LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Ground Power Unit, Aviation (AGPU)	1730-01-144-1897

Personnel Required:

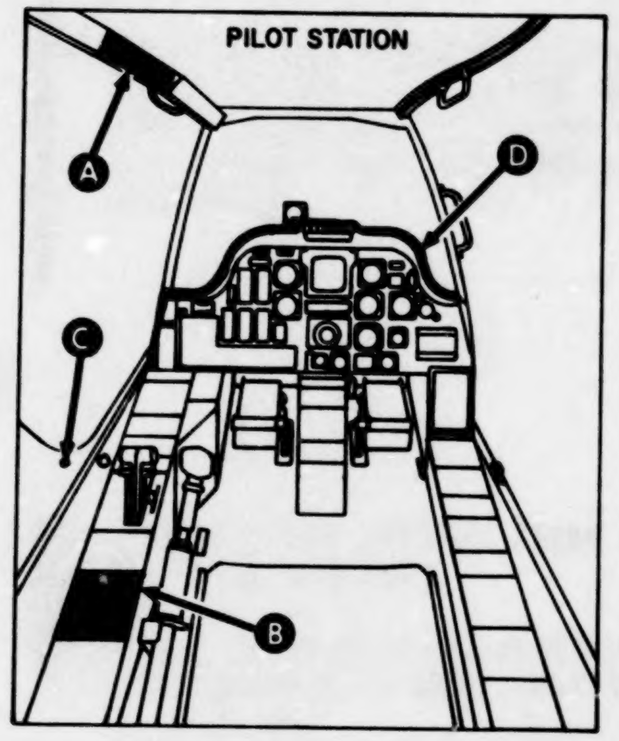
68F10 Aircraft Electrician

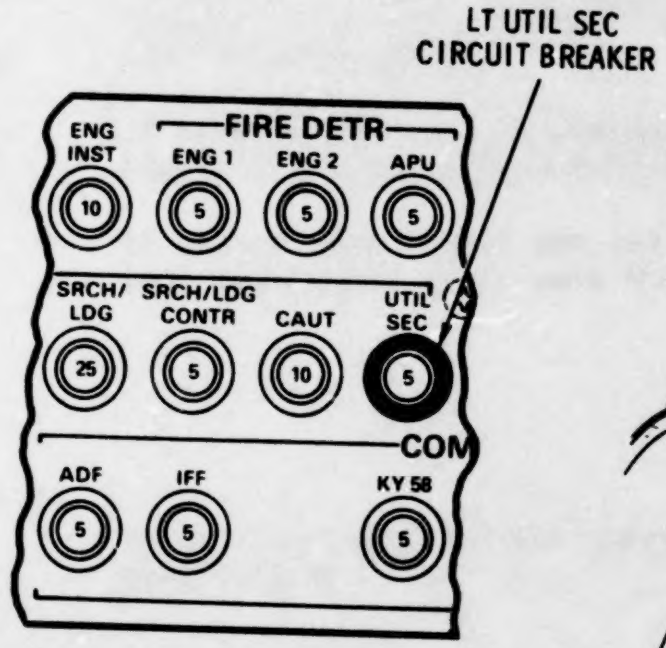
References:

TM 55-1520-238-23

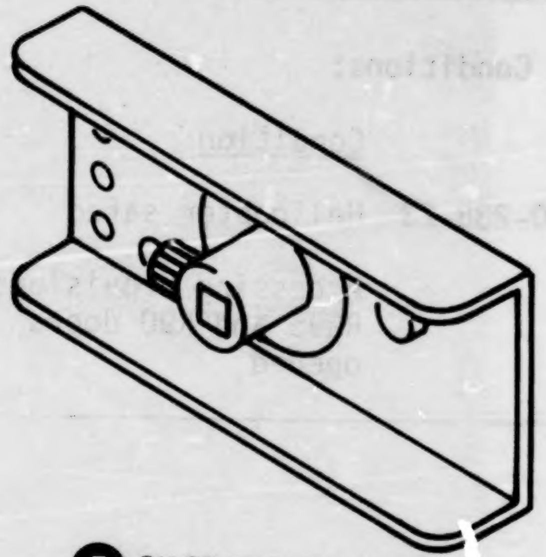
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed

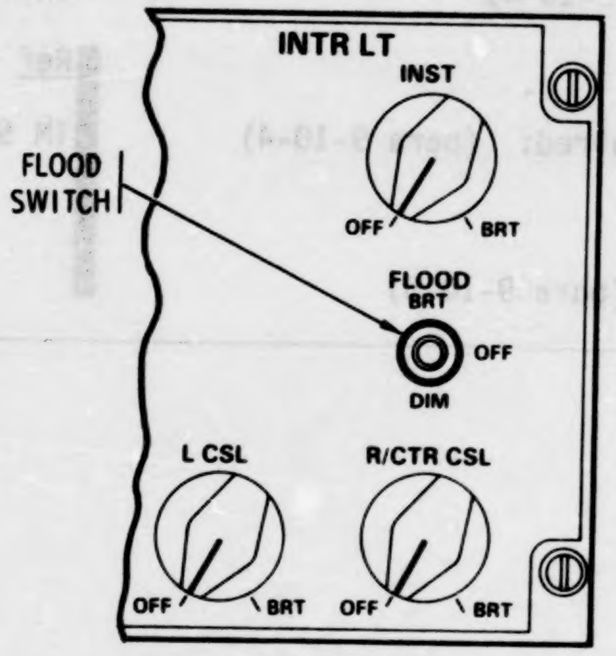

PILOT STATION
A
D
C
B


LT UTIL SEC
CIRCUIT BREAKER
FIRE DETR
ENG INST
ENG 1
ENG 2
APU
10
5
5
5
SRCH/ LDG
SRCH/LDG CONTR
CAUT
UTIL SEC
25
5
10
5
COM
ADF
IFF
KY 58
5
5
5

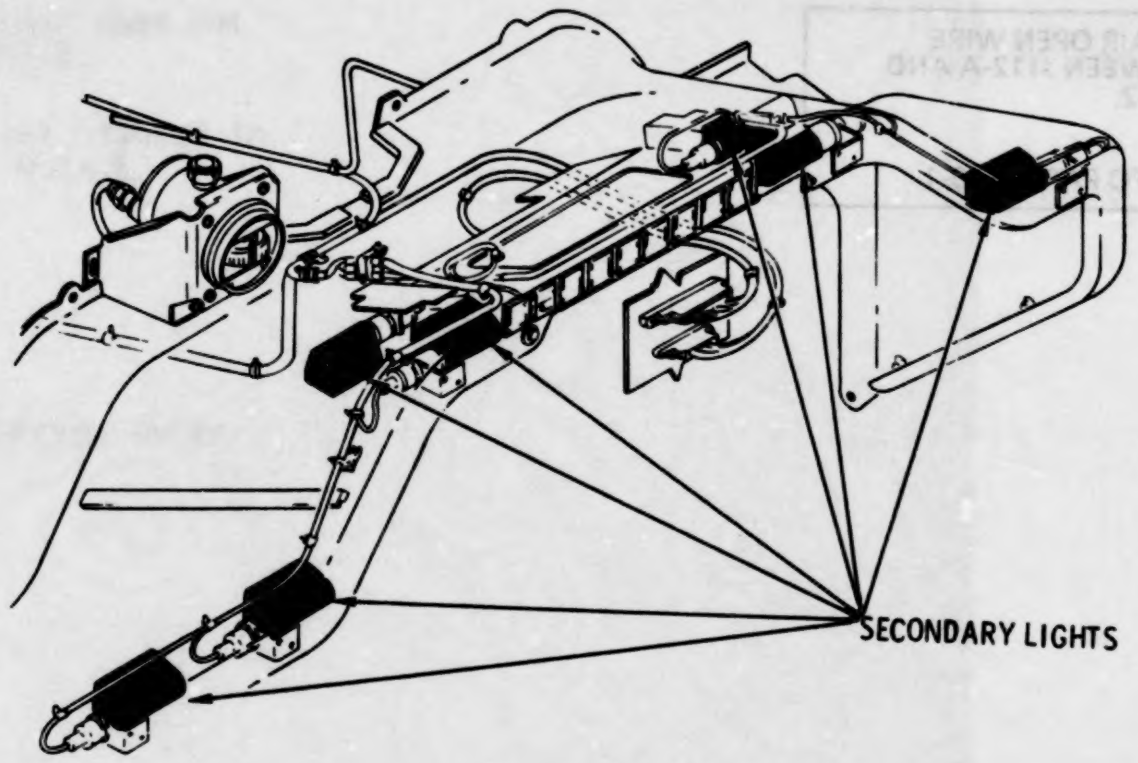
A PILOT CENTER CIRCUIT BREAKER PANEL



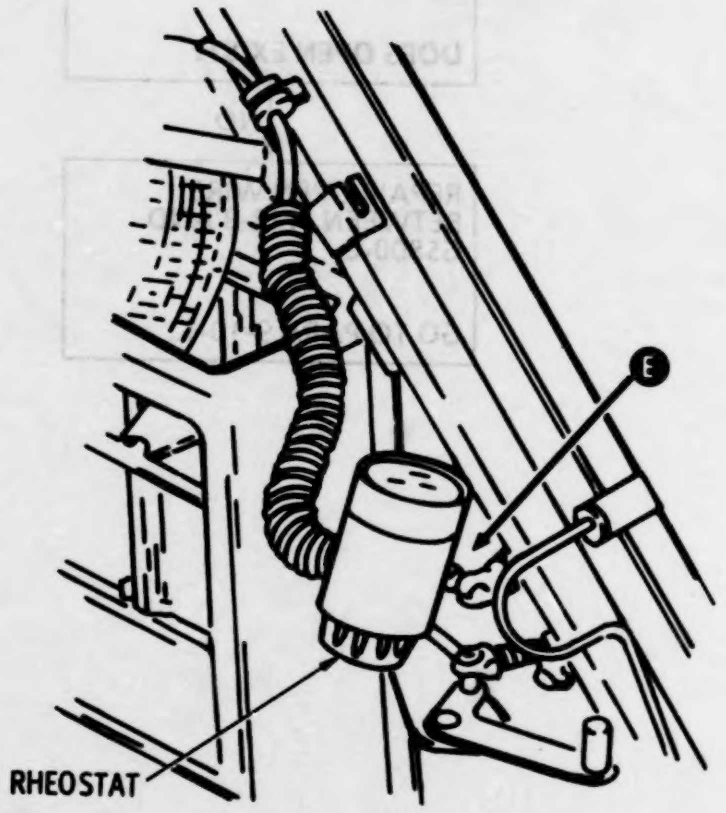
E PILOT UTILITY LIGHT MOUNTING BRACKET


INTR LT
INST
OFF
BRT
FLOOD SWITCH
FLOOD
BRT
OFF
DIM
L CSL
R/CTR CSL
OFF
BRT
OFF
BRT

B PILOT EXT LT/INTR PANEL


SECONDARY LIGHTS

D PILOT GLARESHIELD



C PILOT UTILITY LIGHT

MM04/1-1025D

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

GO TO NEXT PAGE

9-11-1. PILOT UTILITY AND SECONDARY LIGHTS - OPERATIONAL CHECK (cont)

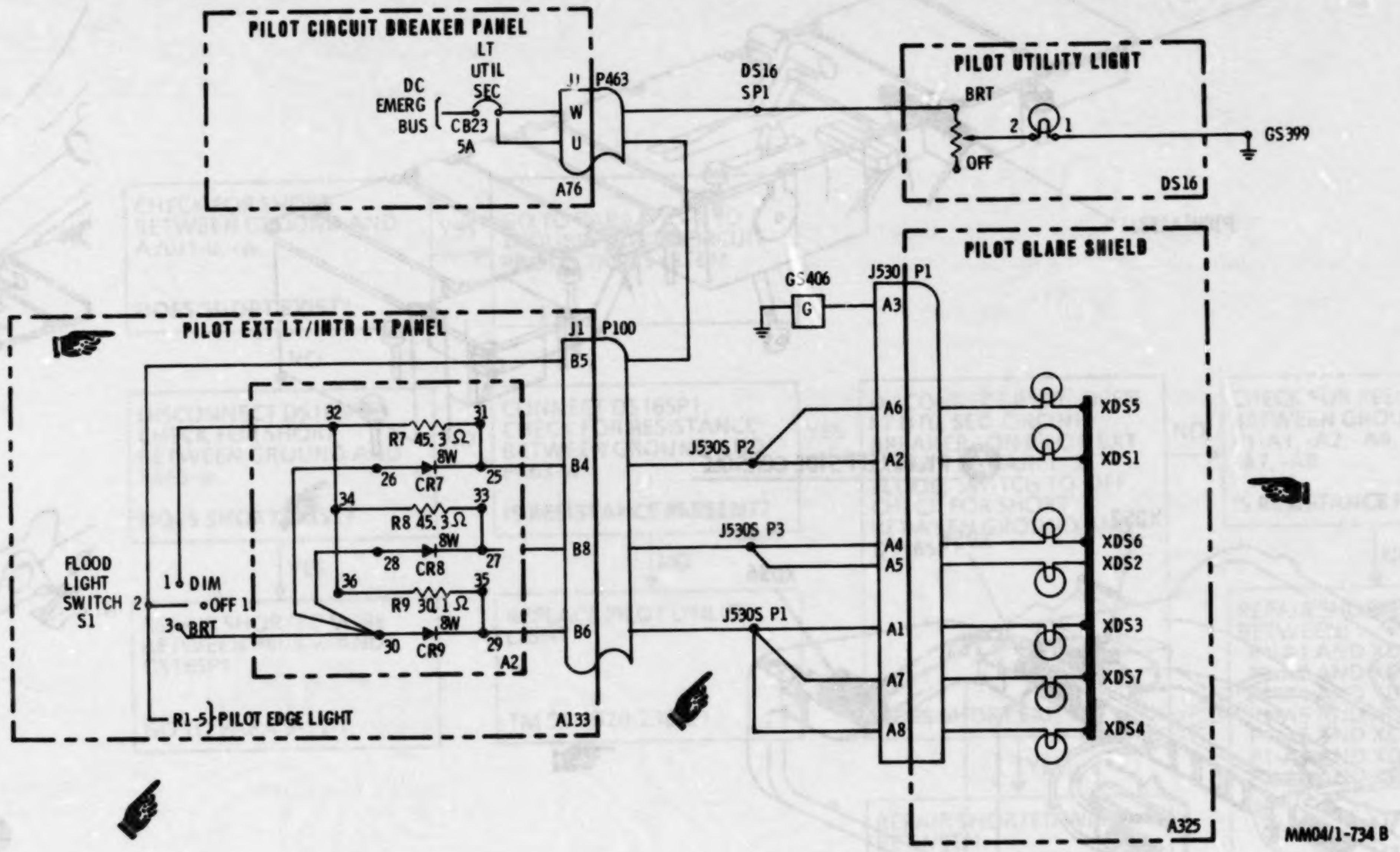
A. Perform operational check as follows:

TASK	RESULT
1. Check for continuity between ground and J530-A3.	If continuity does not exist, repair open wire between J530-A3 and GS406-G.
2. On pilot center circuit breaker panel, check that LT UTIL SEC circuit breaker closed.	If circuit breaker does not stay closed, go to para 9-11-4.
3. Perform External Power Application - Electrical (TM 55-1520-238-23).	
4. On pilot EXT LT/INTR LT panel, set FLOOD switch (S1) to DIM, and then to BRT. Check that all glareshield secondary lights are lighted in both positions.	If all secondary lights light in one position and not the other, replace pilot EXT LT/INTR LT panel (TM 55-1520-238-23). If LT UTIL SEC circuit breaker does not stay closed, go to para 9-11-4. If one or more lights are not lighted in both positions, go to para 9-11-5.
5. Remove pilot utility light from mounting bracket.	
6. While holding pilot utility light, set rheostat to BRT. Utility light is lighted.	If utility light is not lighted, go to para 9-11-6.
7. Reinstall pilot utility light onto mounting bracket.	
8. On pilot EXT LT/INTR LT panel, set FLOOD switch to OFF.	
9. On pilot utility light, turn rheostat to OFF.	

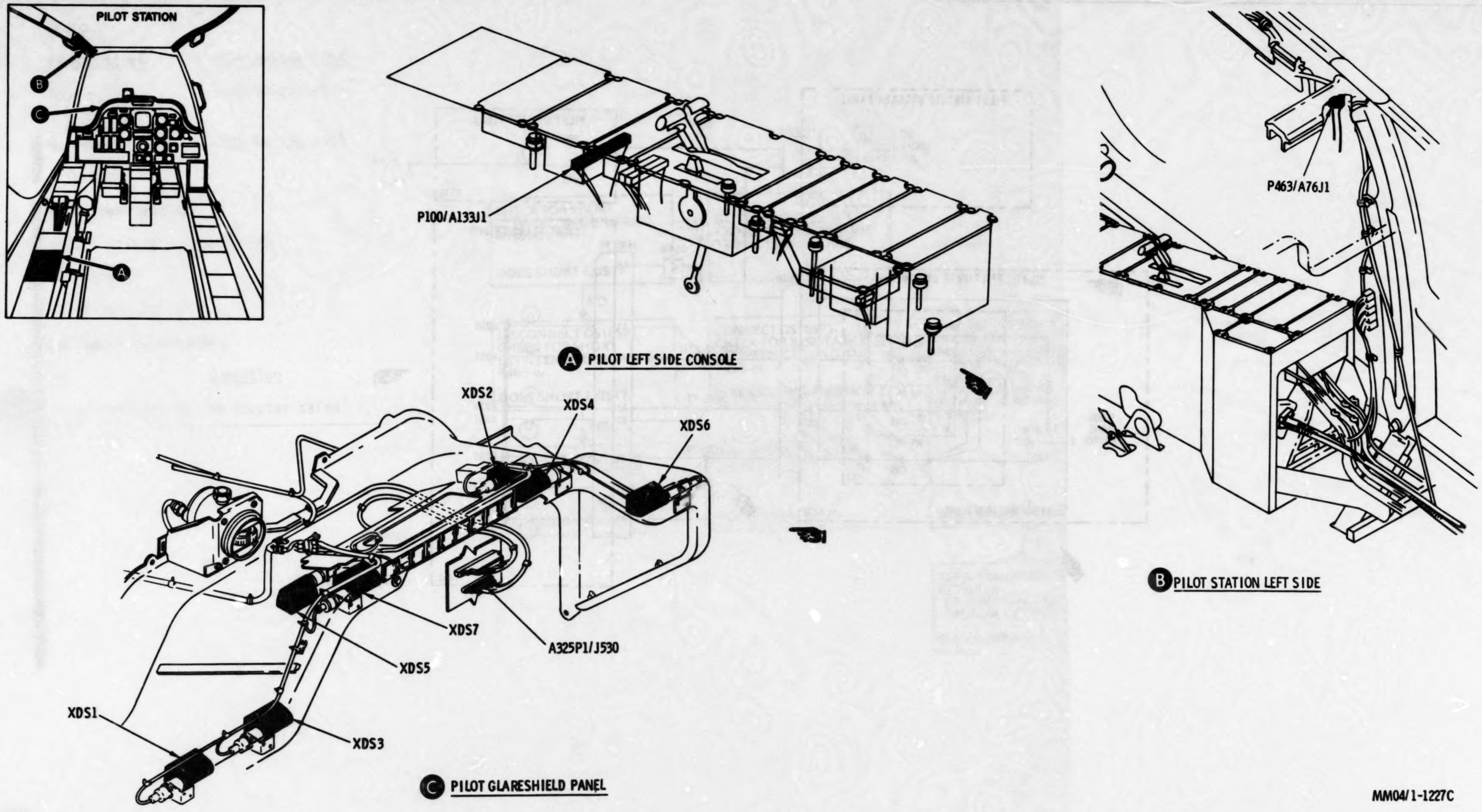
B. Remove external power - Electrical (TM 55-1520-238-23).

END OF TASK

9-11-2. PILOT UTILITY AND SECONDARY LIGHTS - INTERCONNECTION DIAGRAM


PILOT CIRCUIT BREAKER PANEL
DC EMERG BUS
LT UTIL SEC
CB23 5A
J1
P463
W
U
A76
DS16 SP1
PILOT UTILITY LIGHT
BRT
OFF
2
1
DS16
GS399
PILOT GLARE SHIELD
GS406
G
J530
P1
A3
A6
A2
A4
A5
A1
A7
A8
J530S P2
J530S P3
J530S P1
XDS5
XDS1
XDS6
XDS2
XDS3
XDS7
XDS4
A325
PILOT EXT LT/INTR LT PANEL
J1
P100
B5
B4
B8
B6
32
31
R7 45.3 Ω 8W
26
CR7
25
34
33
R8 45.3 Ω 8W
28
CR8
27
36
35
R9 30.1 Ω 8W
30
CR9
29
A2
FLOOD LIGHT SWITCH S1
1 DIM
2
OFF 1
3 BRT
R1-5 PILOT EDGE LIGHT
A133
MM04/1-734 B

9-11-3. PILOT UTILITY AND SECONDARY LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


PILOT STATION
B
C
A
P100/A133J1
XDS2
XDS4
XDS6
XDS7
A325P1/J530
XDS5
XDS1
XDS3
P463/A76J1
MM04/1-1227C

A PILOT LEFT SIDE CONSOLE

C PILOT GLARESHIELD PANEL

B PILOT STATION LEFT SIDE

9-11-4. LT UTIL SEC CIRCUIT BREAKER (CB23) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

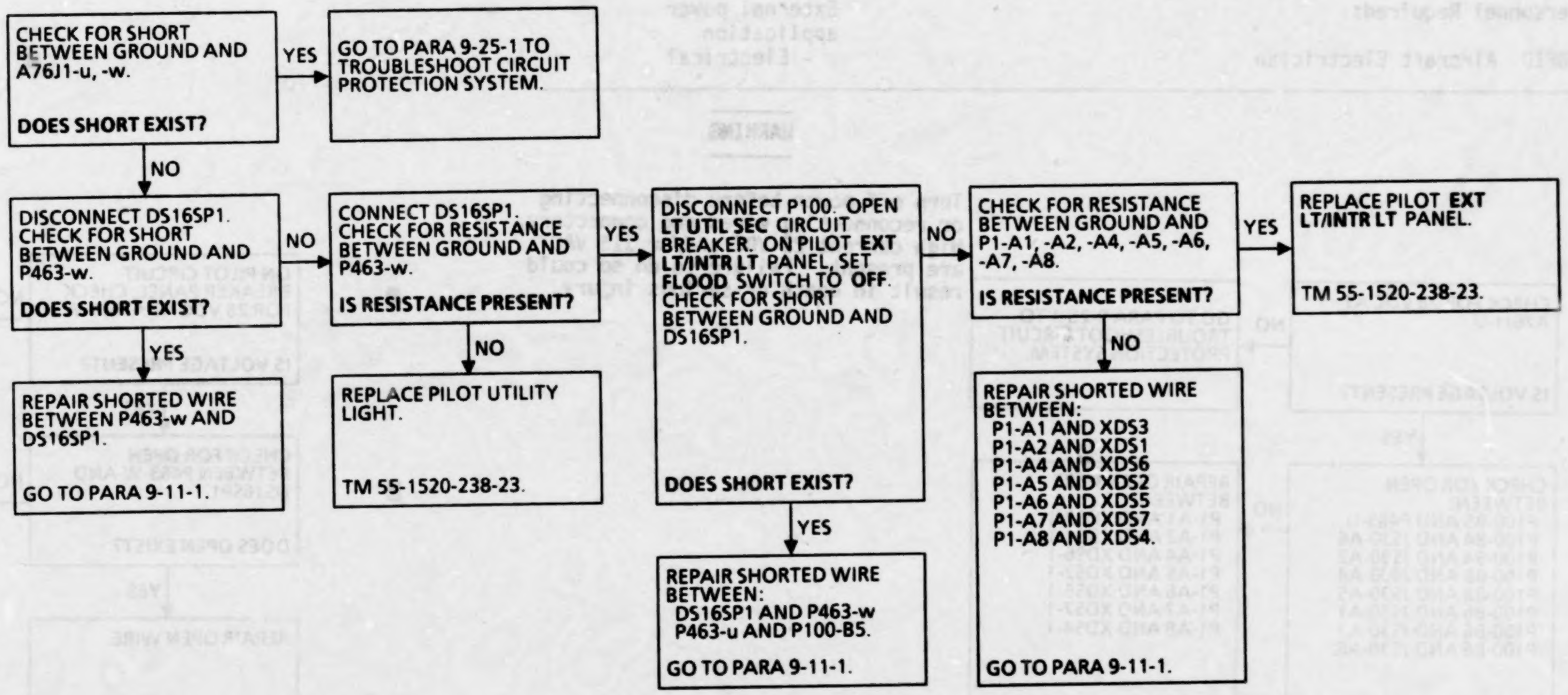
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CHECK FOR SHORT BETWEEN GROUND AND A76J1-u, -w.
DOES SHORT EXIST?
YES
GO TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT DS16SP1. CHECK FOR SHORT BETWEEN GROUND AND P463-w.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN P463-w AND DS16SP1.
GO TO PARA 9-11-1.
NO
CONNECT DS16SP1. CHECK FOR RESISTANCE BETWEEN GROUND AND P463-w.
IS RESISTANCE PRESENT?
NO
REPLACE PILOT UTILITY LIGHT.
TM 55-1520-238-23.
YES
DISCONNECT P100. OPEN LT UTIL SEC CIRCUIT BREAKER. ON PILOT EXT LT/INTR LT PANEL, SET FLOOD SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND DS16SP1.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: DS16SP1 AND P463-w P463-u AND P100-B5.
GO TO PARA 9-11-1.
NO
CHECK FOR RESISTANCE BETWEEN GROUND AND P1-A1, -A2, -A4, -A5, -A6, -A7, -A8.
IS RESISTANCE PRESENT?
YES
REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.
NO
REPAIR SHORTED WIRE BETWEEN:
P1-A1 AND XDS3
P1-A2 AND XDS1
P1-A4 AND XDS6
P1-A5 AND XDS2
P1-A6 AND XDS5
P1-A7 AND XDS7
P1-A8 AND XDS4.
GO TO PARA 9-11-1.

END OF TASK

9-11-5. ONE OR MORE PILOT SECONDARY LIGHTS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

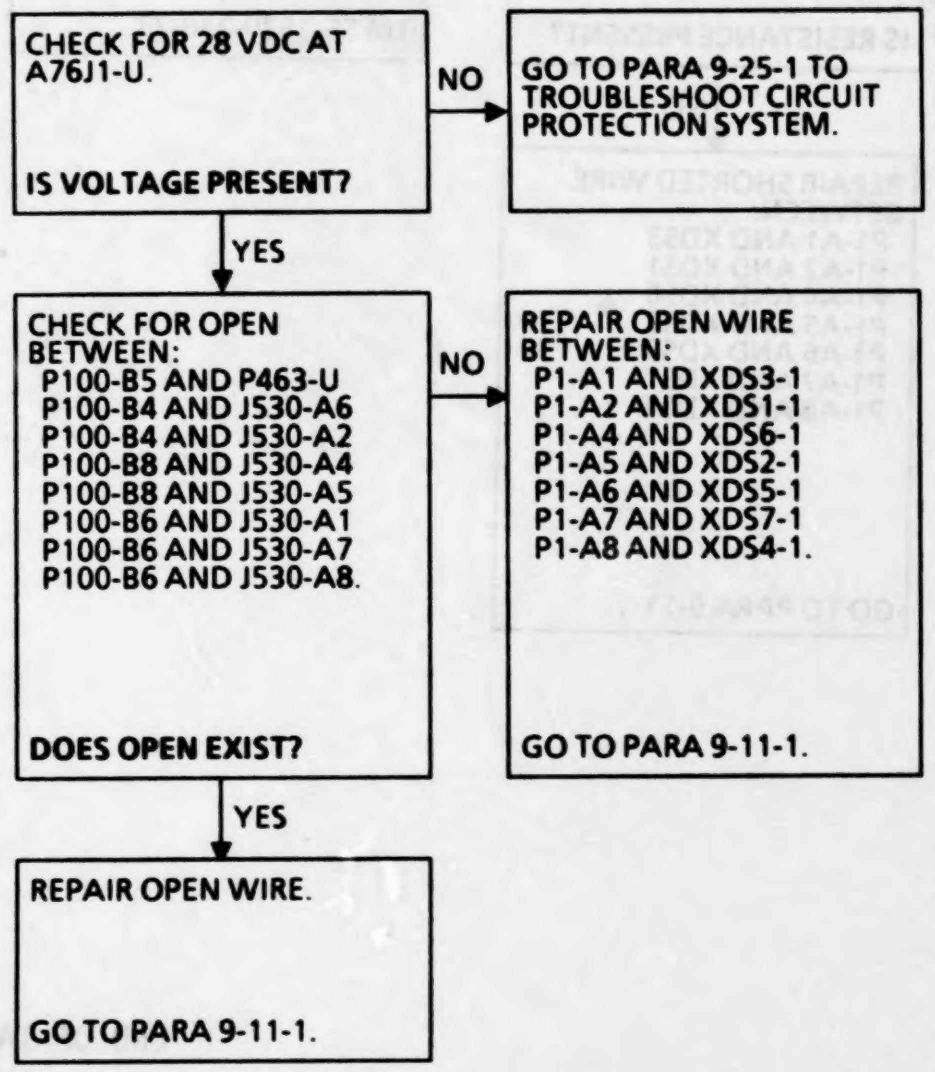
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT A76J1-U.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR OPEN BETWEEN:
P100-B5 AND P463-U
P100-B4 AND J530-A6
P100-B4 AND J530-A2
P100-B8 AND J530-A4
P100-B8 AND J530-A5
P100-B6 AND J530-A1
P100-B6 AND J530-A7
P100-B6 AND J530-A8.
DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN:
P1-A1 AND XDS3-1
P1-A2 AND XDS1-1
P1-A4 AND XDS6-1
P1-A5 AND XDS2-1
P1-A6 AND XDS5-1
P1-A7 AND XDS7-1
P1-A8 AND XDS4-1.
GO TO PARA 9-11-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-11-1.

END OF TASK

9-11-6. PILOT UTILITY LIGHT - DOES NOT LIGHT

Tools: (para 9-11-5)

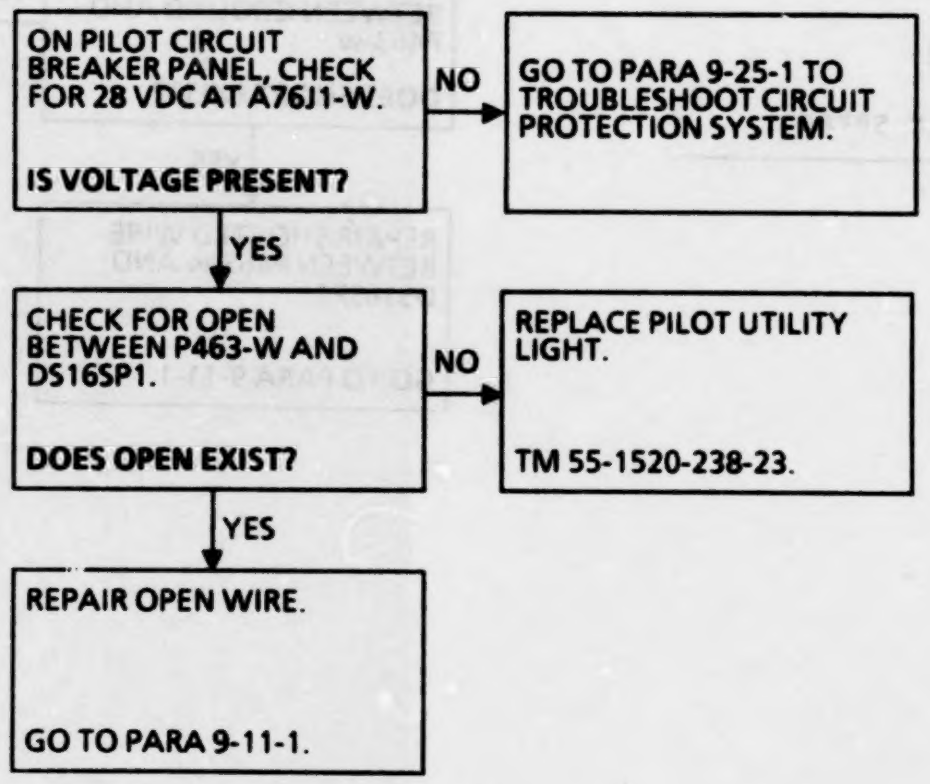
Personnel Required: (para 9-11-5)

References: (para 9-11-5)

Equipment Conditions: (para 9-11-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON PILOT CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT A76J1-W.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR OPEN BETWEEN P463-W AND DS165P1.
DOES OPEN EXIST?
NO
REPLACE PILOT UTILITY LIGHT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-11-1.

END OF TASK

9-12-1. CPG UTILITY AND SECONDARY LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Ground Power Unit, Aviation (AGPU)	1730-01-144-1897

Personnel Required:

68F10 Aircraft Electrician

References:

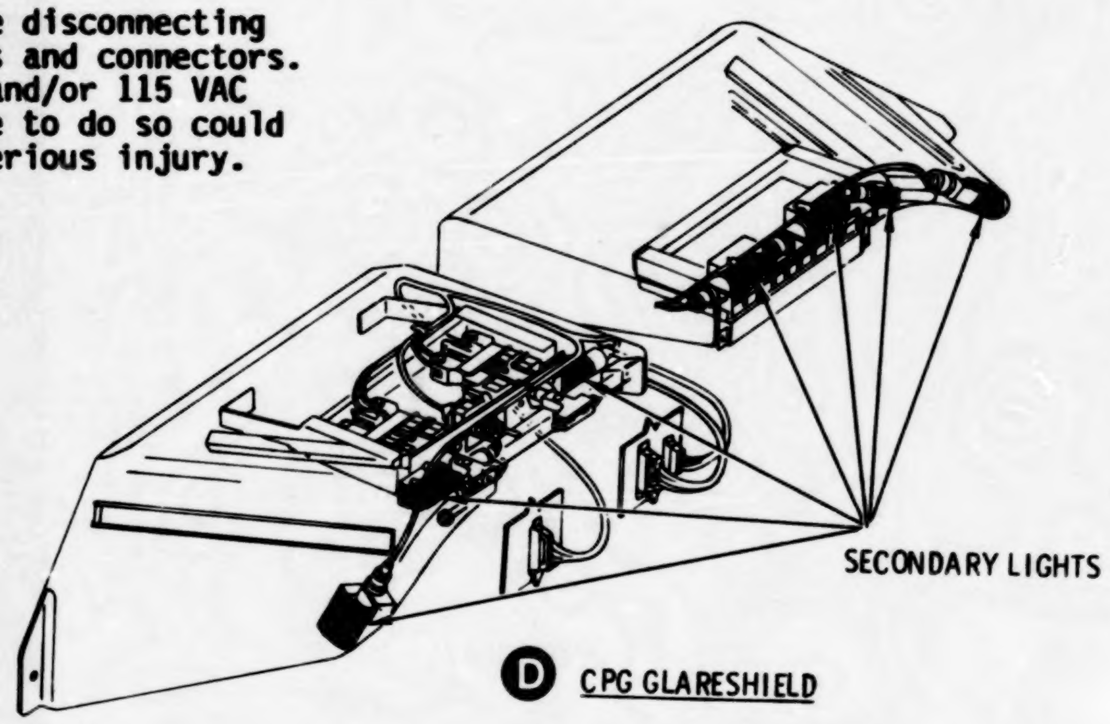
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed

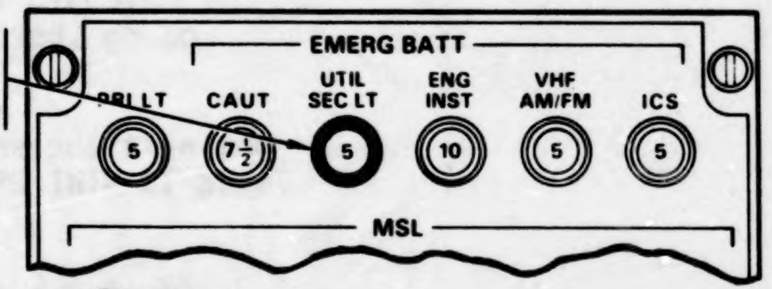
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

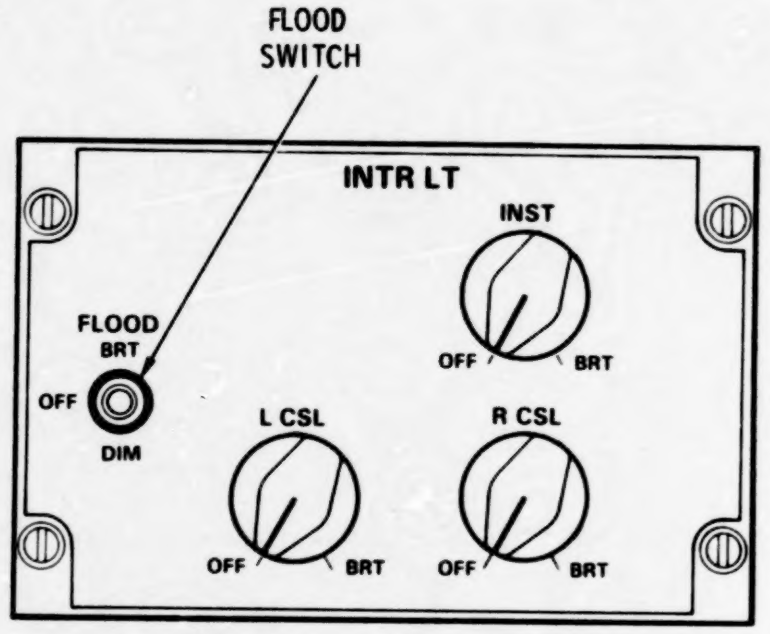

SECONDARY LIGHTS

Ⓓ CPG GLARESHIELD

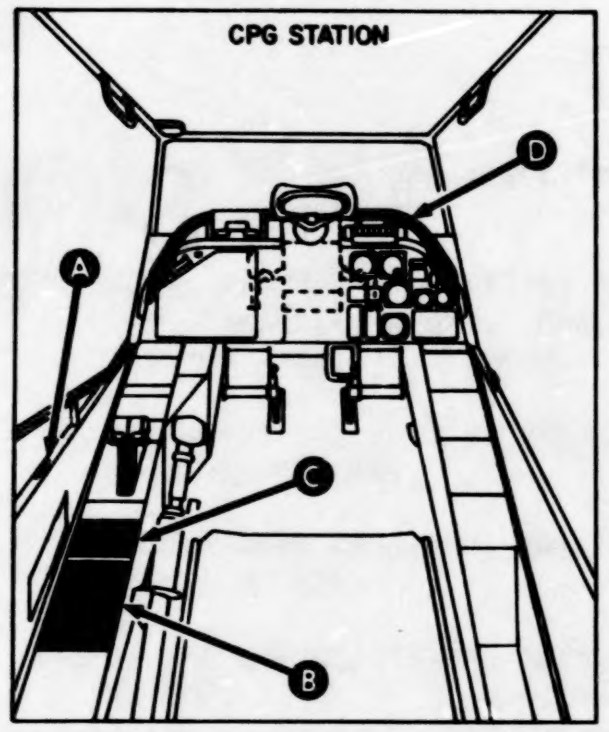
EMERG BATT UTIL SEC LT CIRCUIT BREAKER

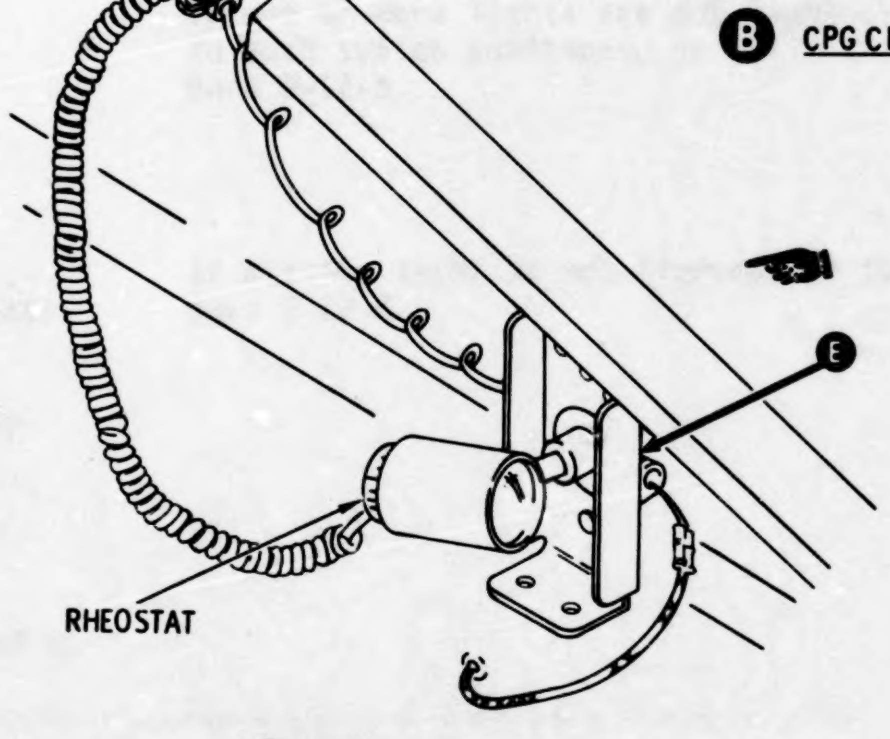

EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7 1/2
5
10
5
5
MSL

Ⓑ CPG CIRCUIT BREAKER PANEL NO. 1

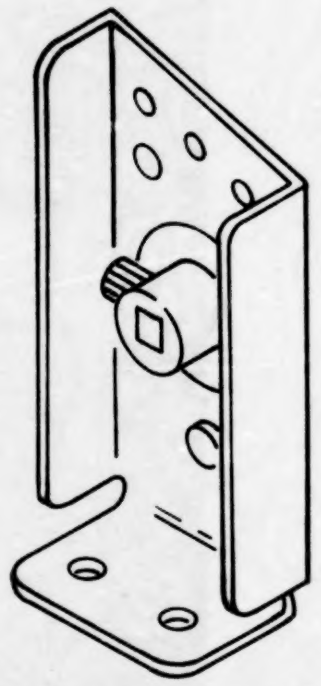

FLOOD SWITCH
INTR LT
INST
OFF
BRT
FLOOD
BRT
OFF
DIM
L CSL
OFF
BRT
R CSL
OFF
BRT

Ⓒ CPG INTR LT PANEL


CPG STATION
D
A
C
B



Ⓐ CPG UTILITY LIGHT



Ⓔ CPG UTILITY LIGHT MOUNTING BRACKET

MM04/1-1026D

GO TO NEXT PAGE

9-12-1. CPG UTILITY AND SECONDARY LIGHTS - OPERATIONAL CHECK (cont)

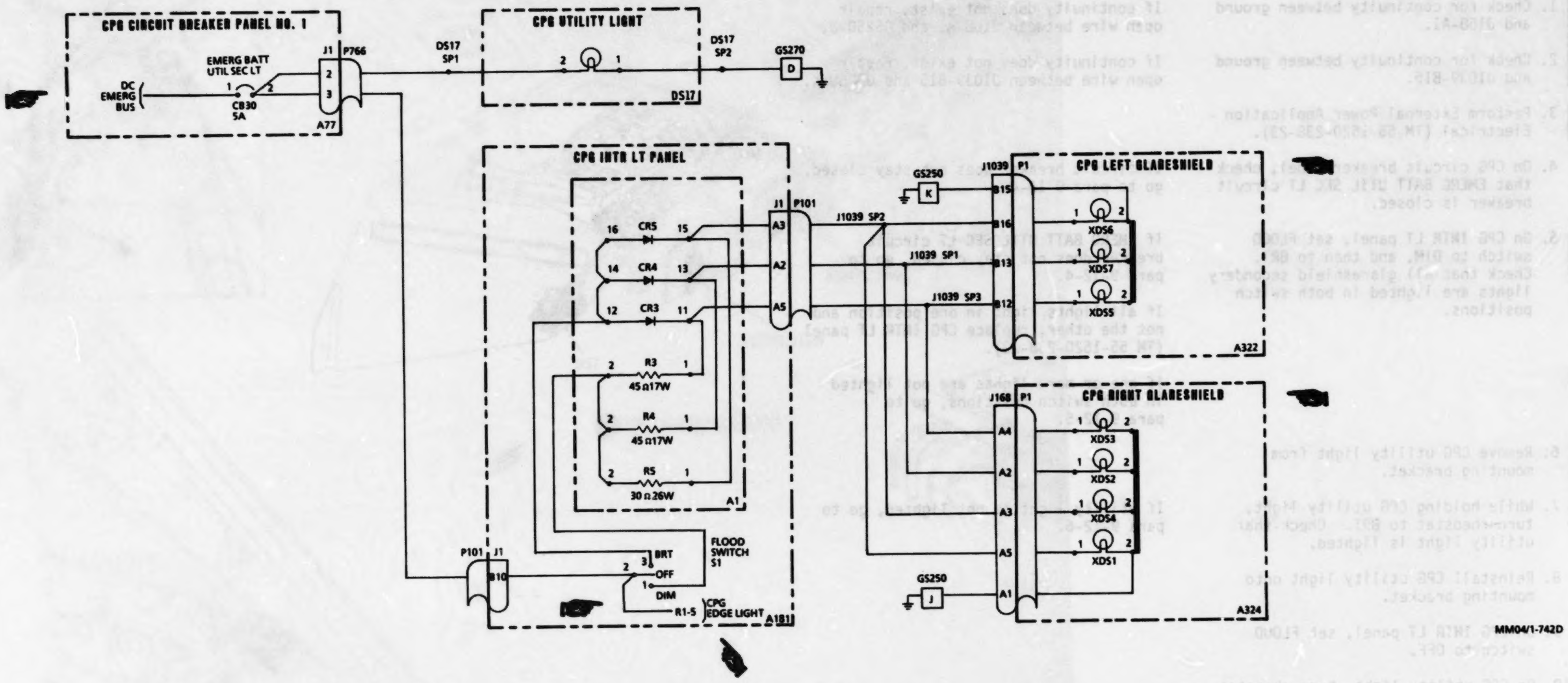
A. Perform operational check as follows:

TASK	RESULT
1. Check for continuity between ground and J168-A1.	If continuity does not exist, repair open wire between J168-A1 and GS250-J.
2. Check for continuity between ground and J1039-B15.	If continuity does not exist, repair open wire between J1039-B15 and GS250-K.
3. Perform External Power Application - Electrical (TM 55-1520-238-23).	
4. On CPG circuit breaker panel, check that **EMERG BATT UTIL SEC LT** circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-12-4.
5. On CPG **INTR LT** panel, set **FLOOD** switch to **DIM**, and then to **BRT**. Check that all glareshield secondary lights are lighted in both switch positions.	If **EMERG BATT UTIL SEC LT** circuit breaker does not stay closed, go to para 9-12-4. If all lights light in one position and not the other, replace CPG **INTR LT** panel (TM 55-1520-238-23). If one or more lights are not lighted in both switch positions, go to para 9-12-5.
6. Remove CPG utility light from mounting bracket.	
7. While holding CPG utility light, turn rheostat to **BRT**. Check that utility light is lighted.	If utility light is not lighted, go to para 9-12-6.
8. Reinstall CPG utility light onto mounting bracket.	
9. On CPG **INTR LT** panel, set **FLOOD** switch to **OFF**.	
10. On CPG utility light, turn rheostat to **OFF**.	

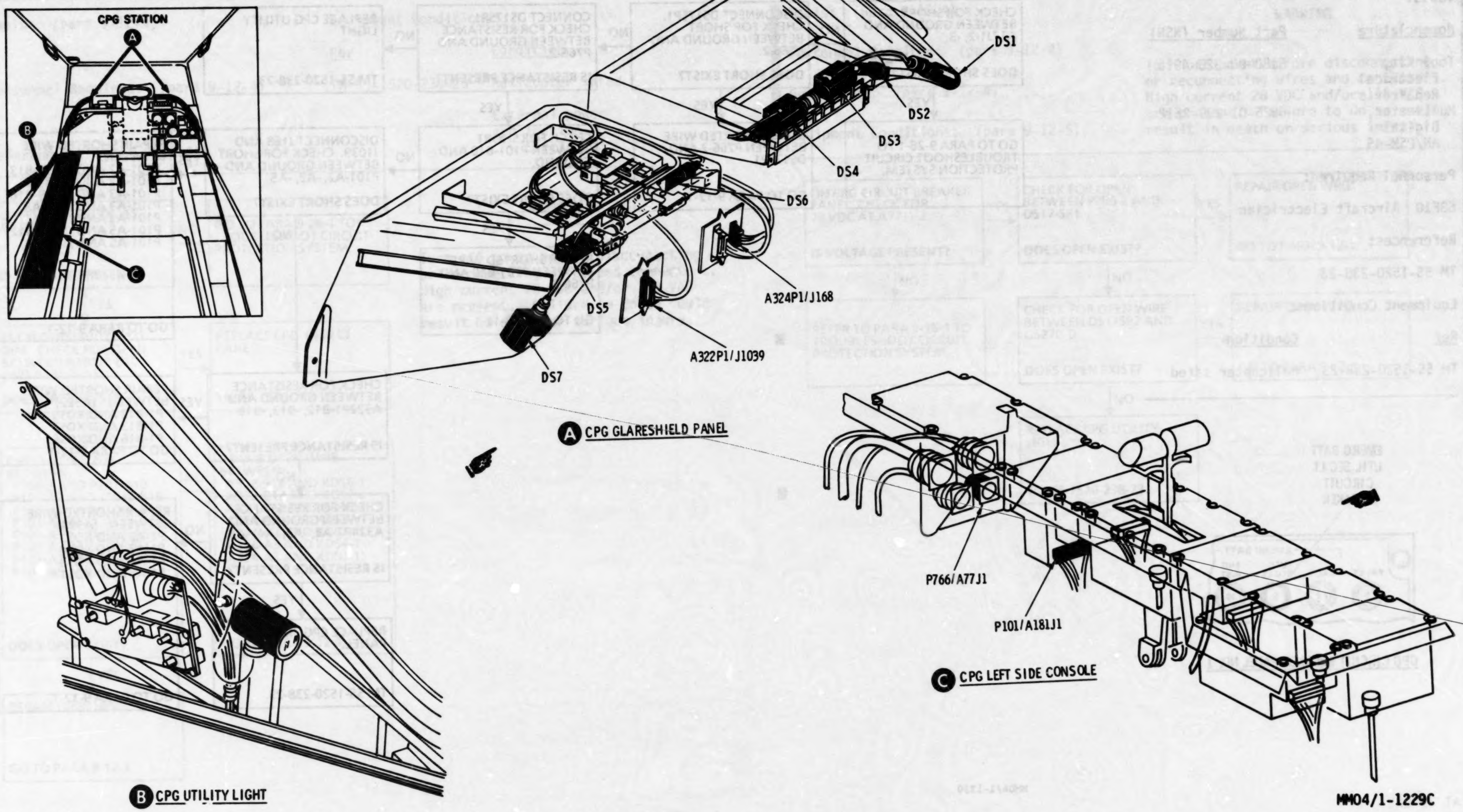
B. Remove external power - Electrical (TM 55-1520-238-23).

END OF TASK

9-12-2. CPG UTILITY AND SECONDARY LIGHTS - INTERCONNECTION DIAGRAM


CPG CIRCUIT BREAKER PANEL NO. 1
DC EMERG BUS
EMERG BATT UTIL SEC LT
CB30 5A
1
2
J1
P766
2
3
A77
DS17 SP1
CPG UTILITY LIGHT
2
1
DS17
DS17 SP2
GS270
D
CPG INTR LT PANEL
16
CR5
15
14
CR4
13
12
CR3
11
J1
P101
A3
A2
A5
R3 45Ω17W
R4 45Ω17W
R5 30Ω26W
2
1
A1
P101
J1
B10
BRT
OFF
DIM
FLOOD SWITCH S1
R1-5
CPG EDGE LIGHT
A181
GS250
K
J1039 SP2
J1039 SP1
J1039 SP3
J1039
P1
B15
B16
B13
B12
CPG LEFT GLARESHIELD
XDS6
XDS7
XDS5
A322
J168
P1
A4
A2
A3
A5
A1
CPG RIGHT GLARESHIELD
XDS3
XDS2
XDS4
XDS1
GS250
J
A324
MM04/1-742D

9-12-3. CPG UTILITY AND SECONDARY LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


CPG STATION
A
B
C
DS1
DS2
DS3
DS4
DS6
DS5
DS7
A324P1/J168
A322P1/J1039
A CPG GLARESHIELD PANEL
B CPG UTILITY LIGHT
P766/A77J1
P101/A181J1
C CPG LEFT SIDE CONSOLE
MM04/1-1229C

9-12-4. EMERG BATT UTIL SEC LT CIRCUIT BREAKER (CB30) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

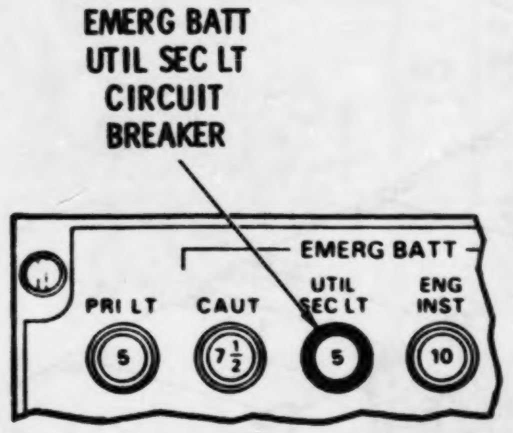
68F10 Aircraft Electrician

References:

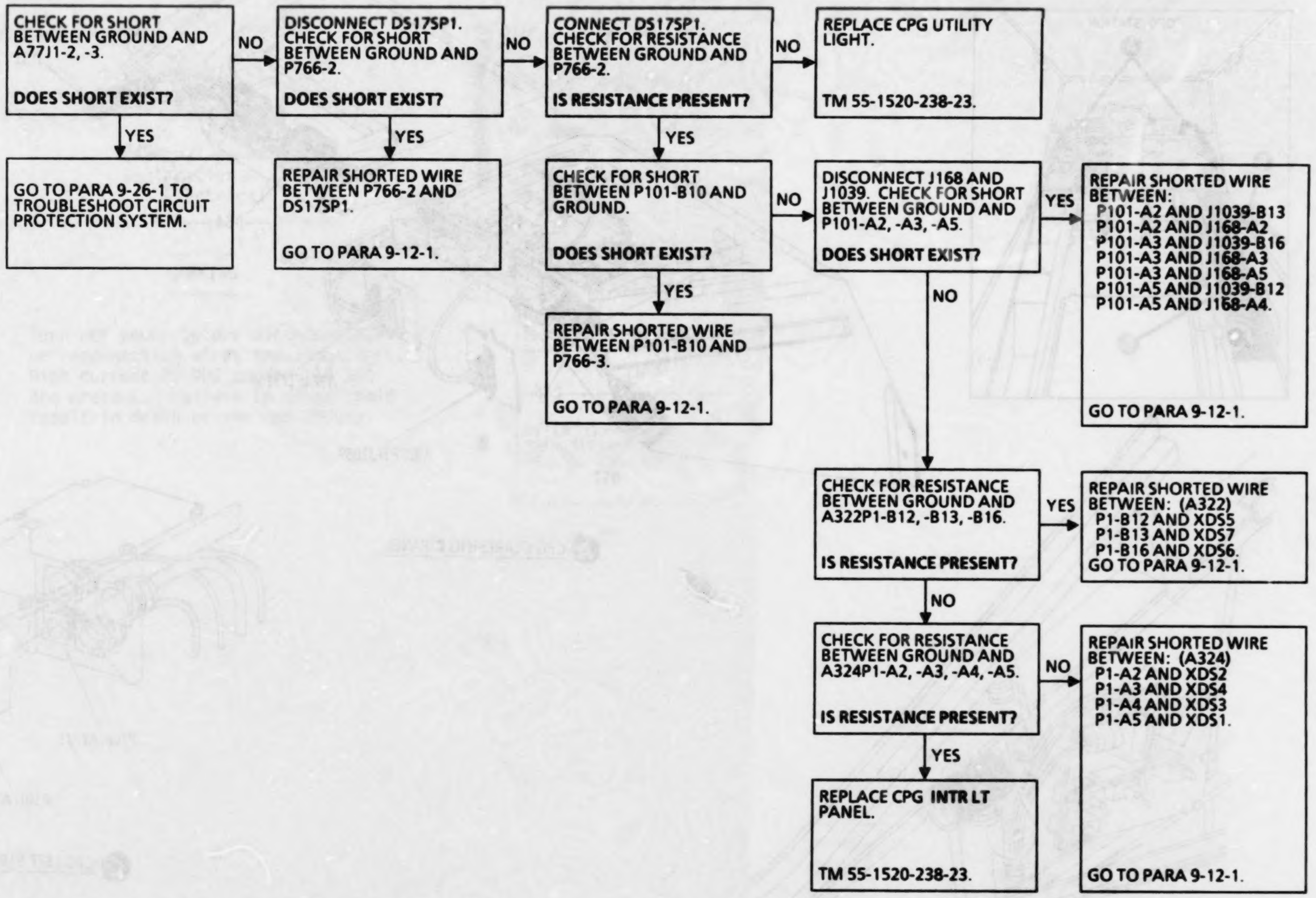
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



CPG CIRCUIT BREAKER PANEL NO. 1



CHECK FOR SHORT BETWEEN GROUND AND A77J1-2, -3.

DOES SHORT EXIST?

GO TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

DISCONNECT DS17SP1. CHECK FOR SHORT BETWEEN GROUND AND P766-2.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN P766-2 AND DS17SP1.

GO TO PARA 9-12-1.

CONNECT DS17SP1. CHECK FOR RESISTANCE BETWEEN GROUND AND P766-2.

IS RESISTANCE PRESENT?

REPLACE CPG UTILITY LIGHT.

TM 55-1520-238-23.

CHECK FOR SHORT BETWEEN P101-B10 AND GROUND.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN P101-B10 AND P766-3.

GO TO PARA 9-12-1.

DISCONNECT J168 AND J1039. CHECK FOR SHORT BETWEEN GROUND AND P101-A2, -A3, -A5.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN:
P101-A2 AND J1039-B13
P101-A2 AND J168-A2
P101-A3 AND J1039-B16
P101-A3 AND J168-A3
P101-A3 AND J168-A5
P101-A5 AND J1039-B12
P101-A5 AND J168-A4.

GO TO PARA 9-12-1.

CHECK FOR RESISTANCE BETWEEN GROUND AND A322P1-B12, -B13, -B16.

IS RESISTANCE PRESENT?

REPAIR SHORTED WIRE BETWEEN: (A322)
P1-B12 AND XDS5
P1-B13 AND XDS7
P1-B16 AND XDS6.
GO TO PARA 9-12-1.

CHECK FOR RESISTANCE BETWEEN GROUND AND A324P1-A2, -A3, -A4, -A5.

IS RESISTANCE PRESENT?

REPAIR SHORTED WIRE BETWEEN: (A324)
P1-A2 AND XDS2
P1-A3 AND XDS4
P1-A4 AND XDS3
P1-A5 AND XDS1.

GO TO PARA 9-12-1.

REPLACE CPG INTR LT PANEL.

TM 55-1520-238-23.

MM04/1-1230

END OF TASK

9-12-5. ONE OR MORE CPG SECONDARY LIGHTS - DO NOT LIGHT

Tools: (para 9-12-4)

Personnel Required: (para 9-12-4)

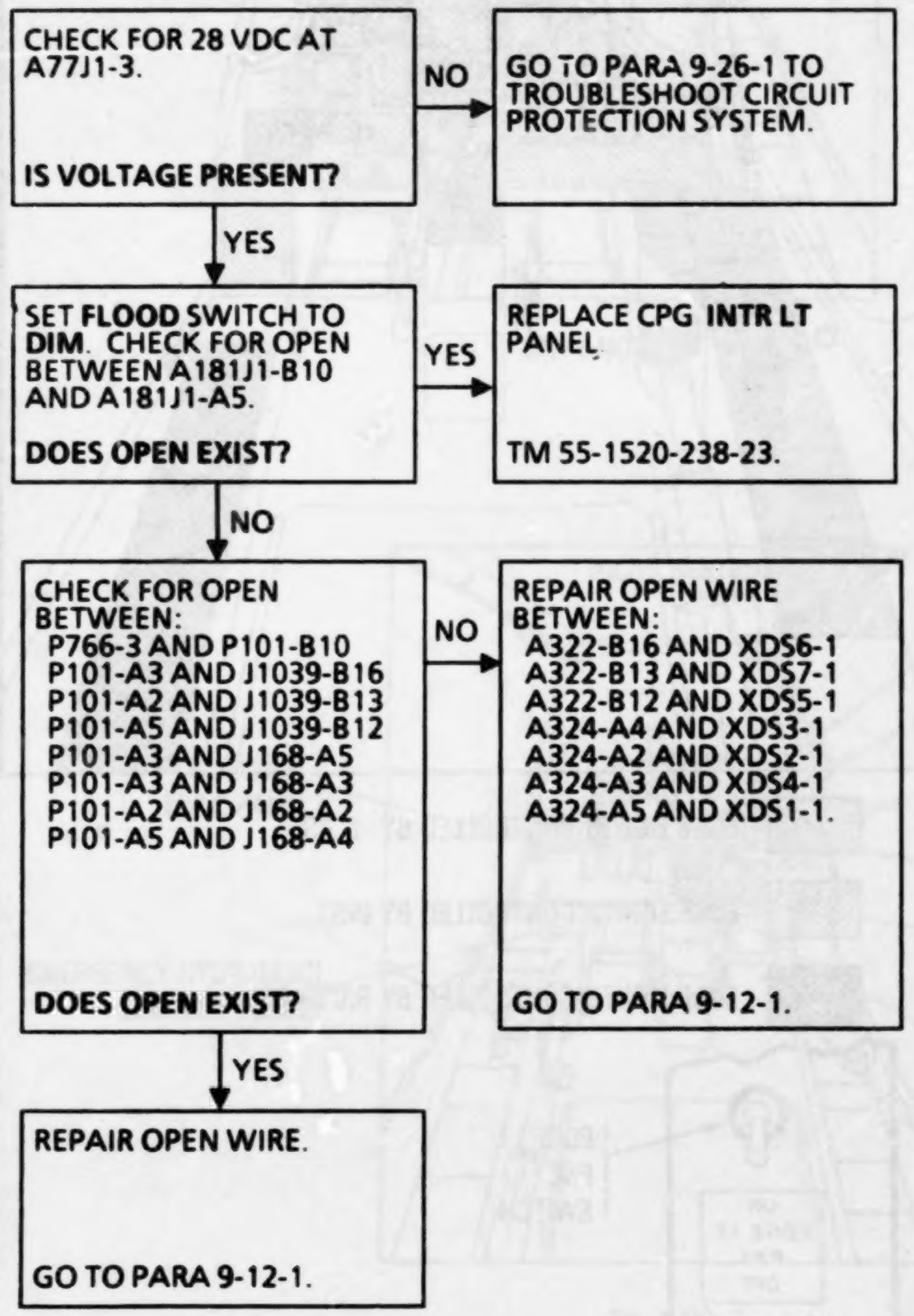
References: (para 9-12-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT A77J1-3.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
SET FLOOD SWITCH TO DIM. CHECK FOR OPEN BETWEEN A181J1-B10 AND A181J1-A5.
DOES OPEN EXIST?
YES
REPLACE CPG INTR LT PANEL
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN:
P766-3 AND P101-B10
P101-A3 AND J1039-B16
P101-A2 AND J1039-B13
P101-A5 AND J1039-B12
P101-A3 AND J168-A5
P101-A3 AND J168-A3
P101-A2 AND J168-A2
P101-A5 AND J168-A4
DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN:
A322-B16 AND XDS6-1
A322-B13 AND XDS7-1
A322-B12 AND XDS5-1
A324-A4 AND XDS3-1
A324-A2 AND XDS2-1
A324-A3 AND XDS4-1
A324-A5 AND XDS1-1.
GO TO PARA 9-12-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-12-1.

END OF TASK

9-12-6. CPG UTILITY LIGHT DOES NOT LIGHT

Tools: (para 9-12-4)

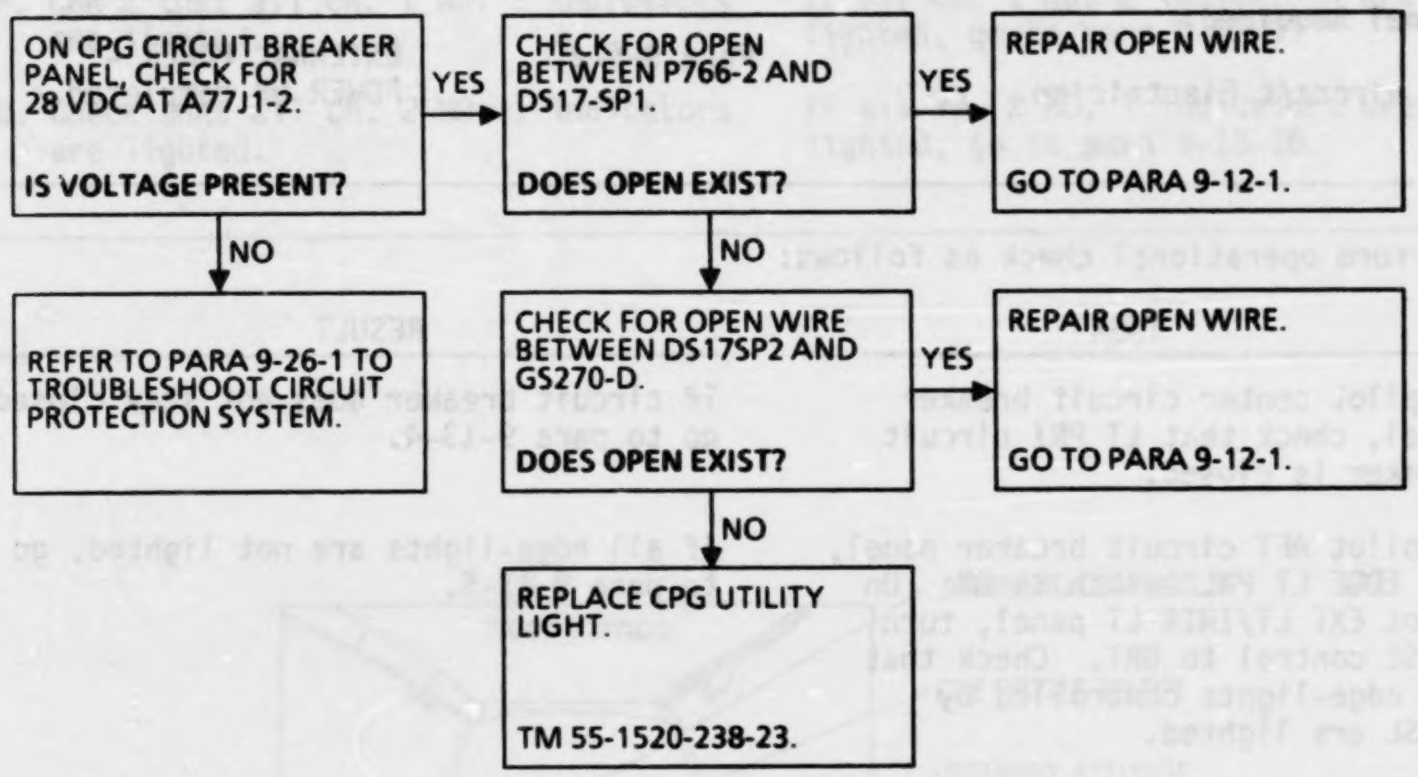
Personnel Required: (para 9-12-4)

References: (para 9-12-4)

Equipment Conditions: (para 9-12-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT A77J1-2.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN P766-2 AND DS17-SP1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-12-1.
NO
REFER TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
CHECK FOR OPEN WIRE BETWEEN DS17SP2 AND GS270-D.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-12-1.
NO
REPLACE CPG UTILITY LIGHT.
TM 55-1520-238-23.

END OF TASK

9-13-1. PILOT EDGE-LIGHT - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

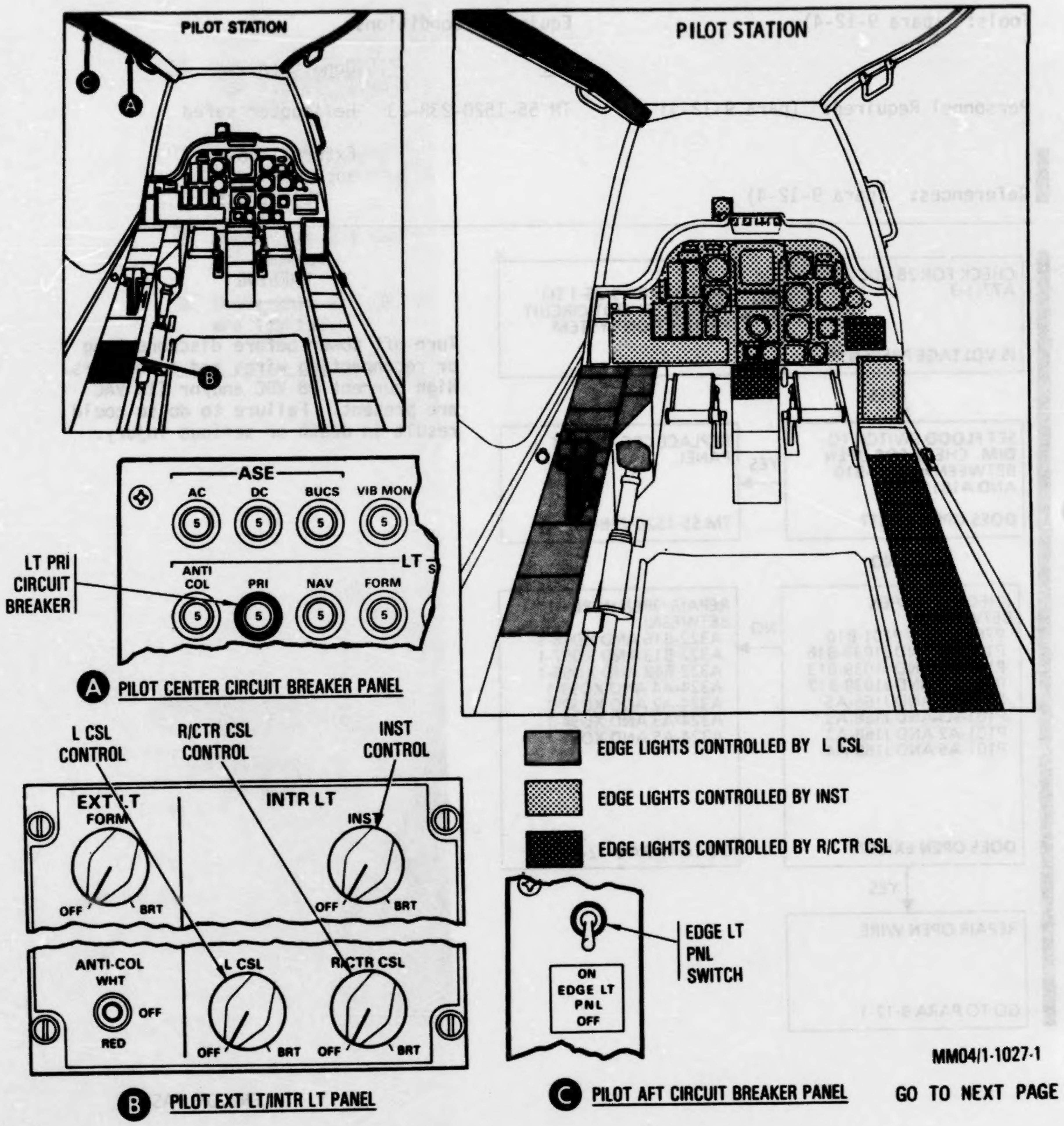
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER POWER UP completed

A. Perform operational check as follows:

TASK	RESULT
1. On pilot center circuit breaker panel, check that LT PRI circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-13-4.
2. On pilot AFT circuit breaker panel, set EDGE LT PNL switch to ON. On pilot EXT LT/INTR LT panel, turn L CSL control to BRT. Check that all edge-lights controlled by L CSL are lighted.	If all edge-lights are not lighted, go to para 9-13-5.
3. On pilot EXT LT/INTR LT panel, turn R/CTR CSL control to BRT. Check that all edge-lights controlled by R/CTR CSL are lighted.	If all edge-lights are not lighted, go to para 9-13-6.
4. On pilot EXT LT/INTR LT panel, turn INST control to BRT. Check that all edge-lights controlled by INST are lighted.	If all edge-lights are not lighted, go to para 9-13-7.


PILOT STATION
A
B
C
PILOT STATION
ASE
AC
DC
BUCS
VIB MON
LT
ANTI COL
PRI
NAV
FORM
LT PRI CIRCUIT BREAKER
L CSL CONTROL
R/CTR CSL CONTROL
INST CONTROL
EXT LT
FORM
OFF
BRT
INTR LT
INST
OFF
BRT
ANTI-COL
WHT
OFF
RED
L CSL
OFF
BRT
R/CTR CSL
OFF
BRT
▨ EDGE LIGHTS CONTROLLED BY L CSL
░ EDGE LIGHTS CONTROLLED BY INST
■ EDGE LIGHTS CONTROLLED BY R/CTR CSL
EDGE LT PNL SWITCH
ON
EDGE LT
PNL
OFF
MM04/1-1027-1

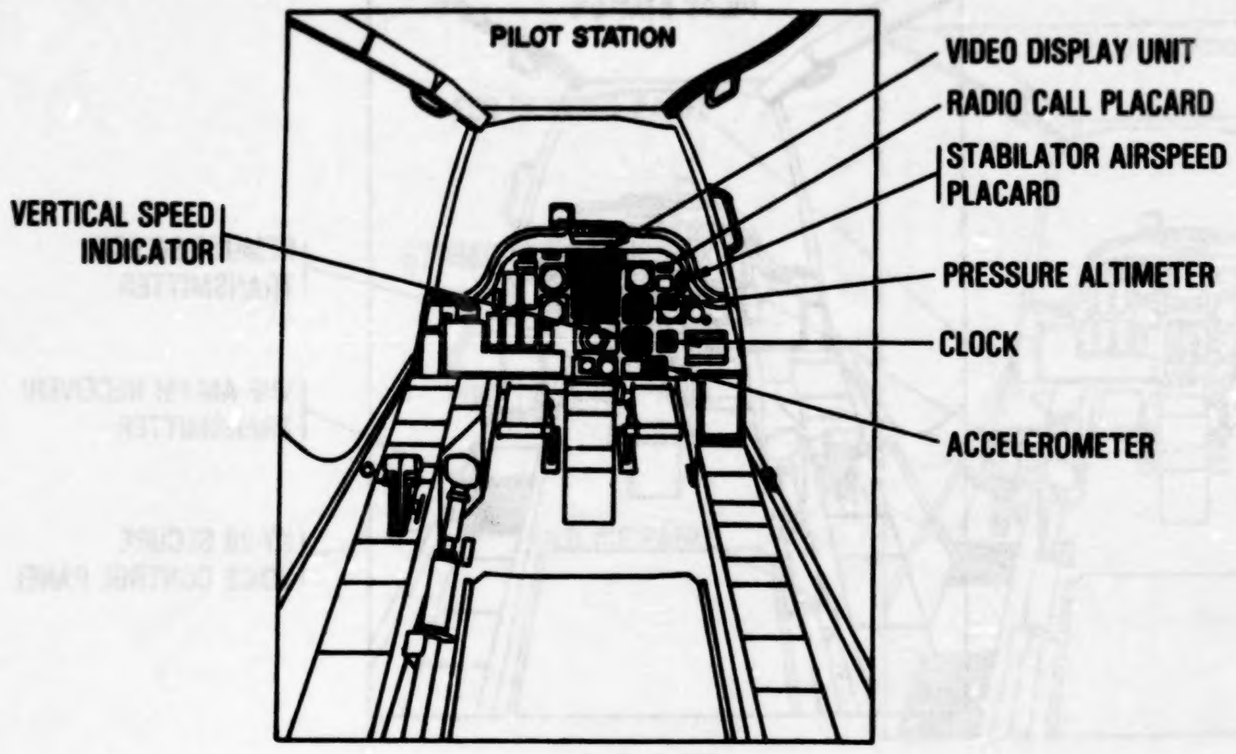
Ⓐ PILOT CENTER CIRCUIT BREAKER PANEL

Ⓑ PILOT EXT LT/INTR LT PANEL

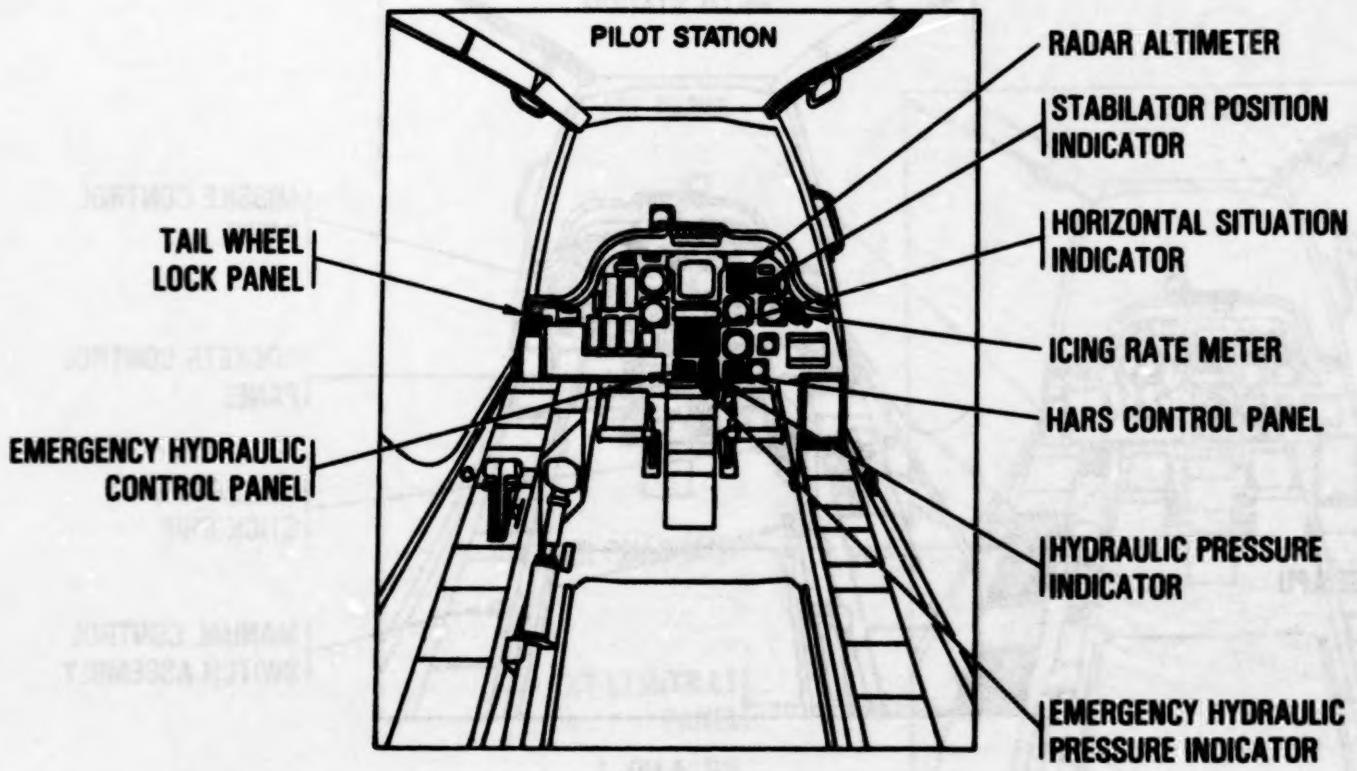
Ⓒ PILOT AFT CIRCUIT BREAKER PANEL

GO TO NEXT PAGE

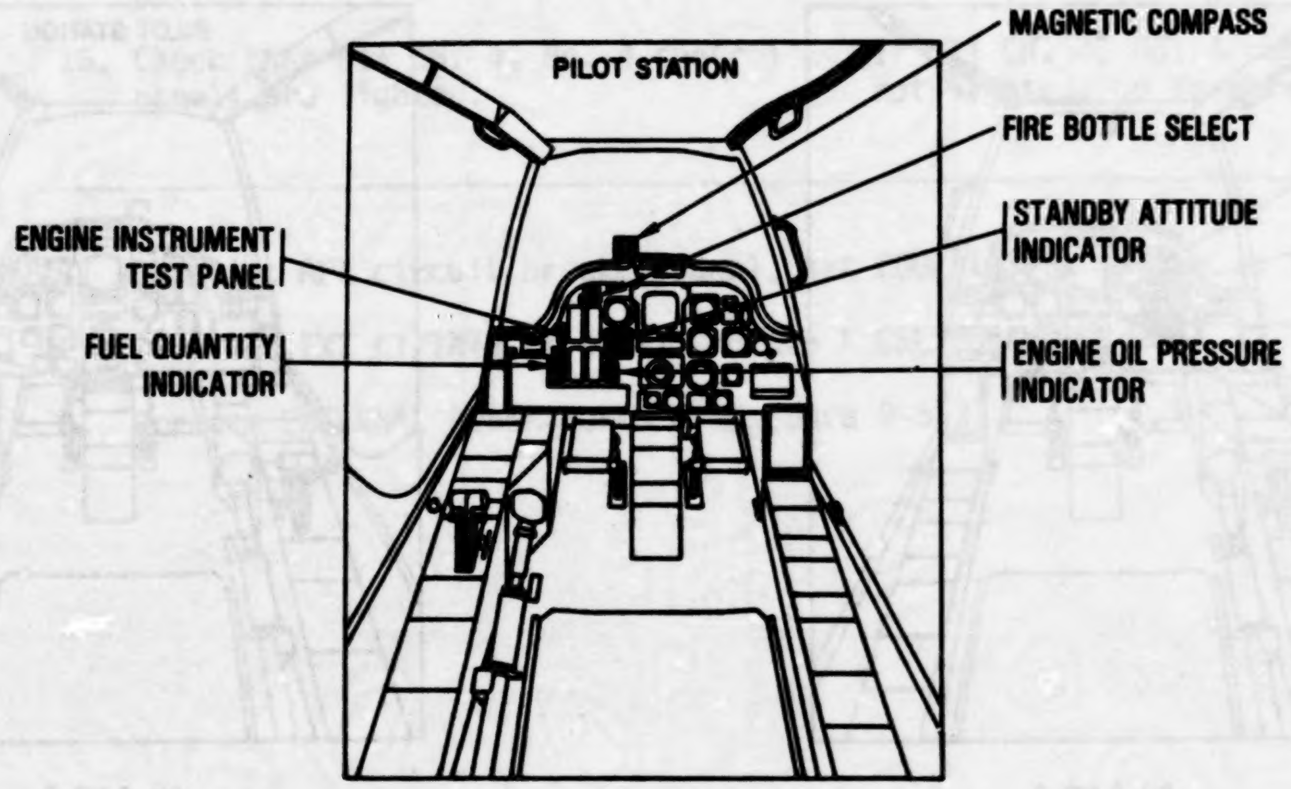
9-13-1. PILOT EDGE-LIGHT - OPERATIONAL CHECK (cont)


PILOT STATION
VIDEO DISPLAY UNIT
RADIO CALL PLACARD
STABILATOR AIRSPEED PLACARD
VERTICAL SPEED INDICATOR
PRESSURE ALTIMETER
CLOCK
ACCELEROMETER

CH. 1 NO. 1


PILOT STATION
RADAR ALTIMETER
STABILATOR POSITION INDICATOR
TAIL WHEEL LOCK PANEL
HORIZONTAL SITUATION INDICATOR
ICING RATE METER
HARS CONTROL PANEL
EMERGENCY HYDRAULIC CONTROL PANEL
HYDRAULIC PRESSURE INDICATOR
EMERGENCY HYDRAULIC PRESSURE INDICATOR

CH. 1 NO. 2


PILOT STATION
MAGNETIC COMPASS
FIRE BOTTLE SELECT
STANDBY ATTITUDE INDICATOR
ENGINE INSTRUMENT TEST PANEL
FUEL QUANTITY INDICATOR
ENGINE OIL PRESSURE INDICATOR

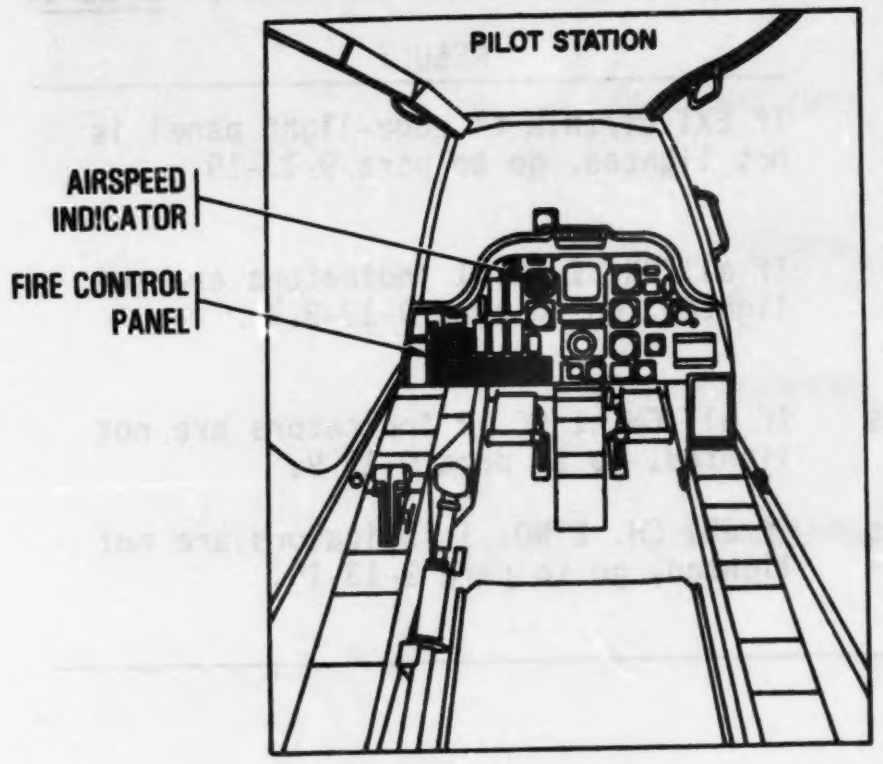
CH . 2 NO. 1

TASK	RESULT
5. Rotate L CSL control to BRT. Check that EXT LT/INTR LT edge-light panel is lighted.	If EXT LT/INTR LT edge-light panel is not lighted, go to para 9-13-19.
6. Rotate INST control. Check that all CH. 1 NO. 1 indicators edge-lights are lighted.	If all CH. 1 NO. 1 indicators are not lighted, go to para 9-13-8.
7. Check that all CH. 1 NO. 2 indicators are lighted.	If all CH. 1 NO. 2 indicators are not lighted, go to para 9-13-9.
8. Check that all CH. 2 NO. 1 indicators are lighted.	If all CH. 2 NO. 1 indicators are not lighted, go to para 9-13-10.

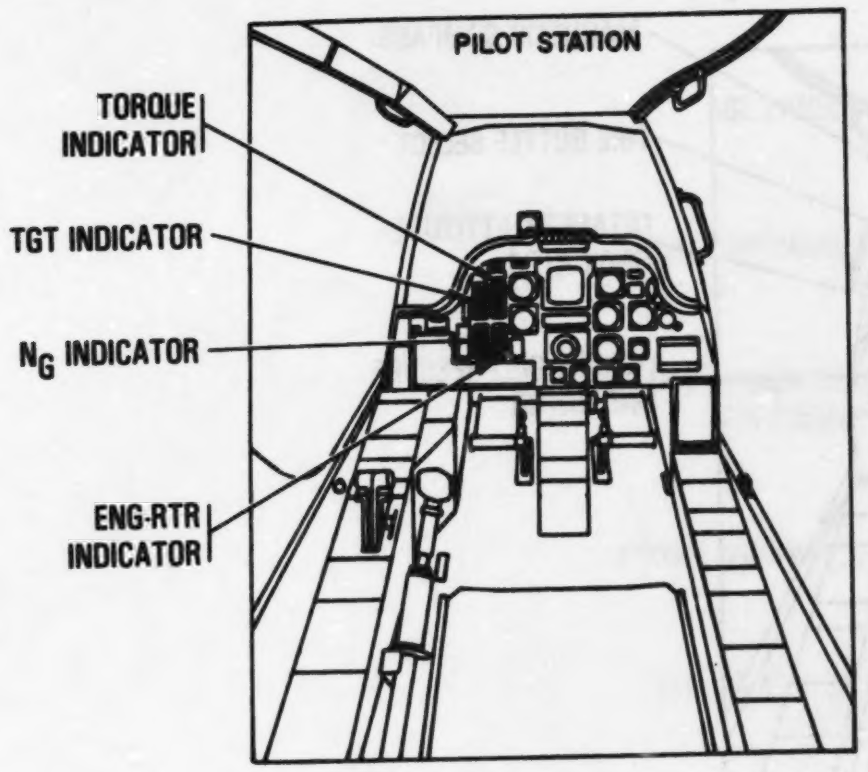
MM04/1-1027-2

GO TO NEXT PAGE

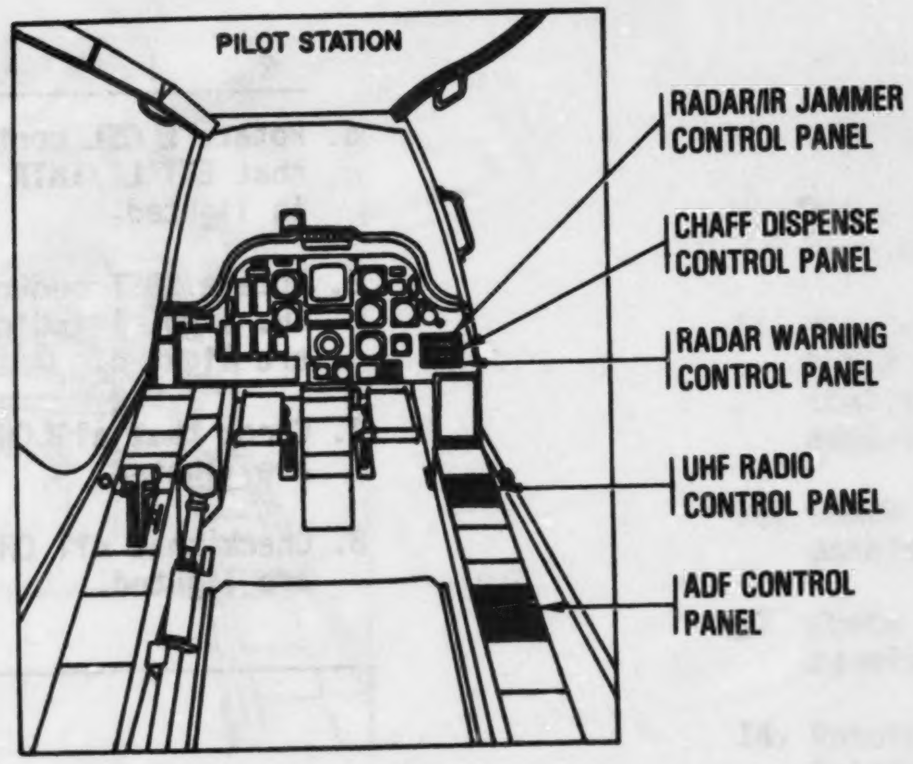
9-13-1. PILOT EDGE-LIGHT - OPERATIONAL CHECK (cont)


PILOT STATION
AIRSPEED INDICATOR
FIRE CONTROL PANEL

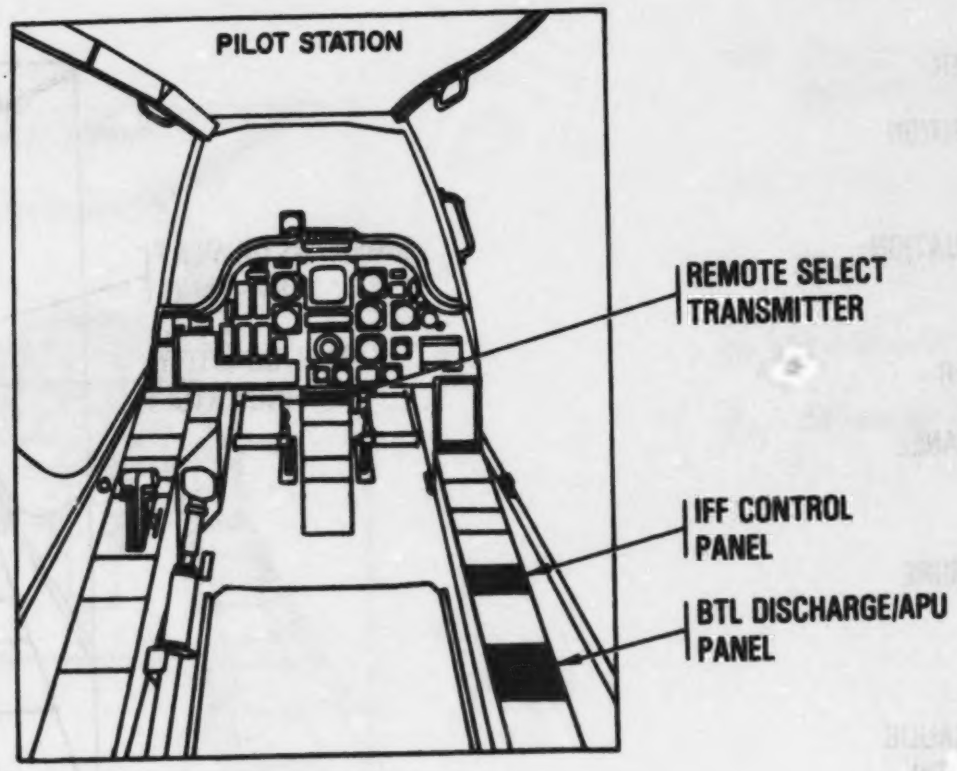
CH. 2 NO. 2


PILOT STATION
TORQUE INDICATOR
TGT INDICATOR
N_G INDICATOR
ENG-RTR INDICATOR

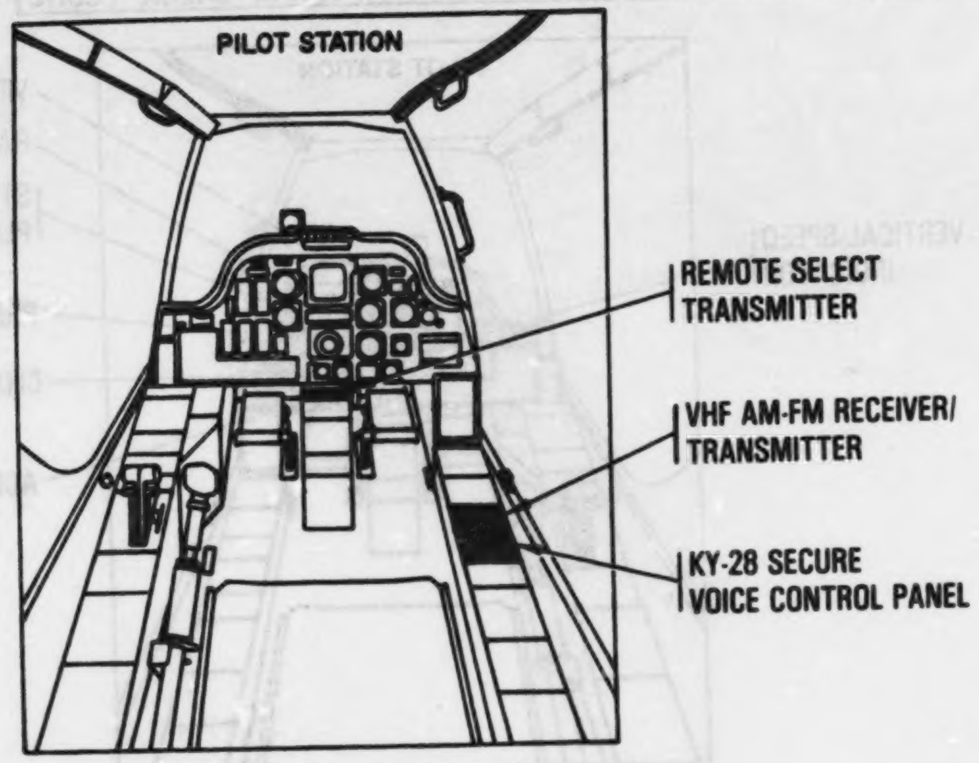
CH. 2 NO. 3


PILOT STATION
RADAR/IR JAMMER CONTROL PANEL
CHAFF DISPENSE CONTROL PANEL
RADAR WARNING CONTROL PANEL
UHF RADIO CONTROL PANEL
ADF CONTROL PANEL

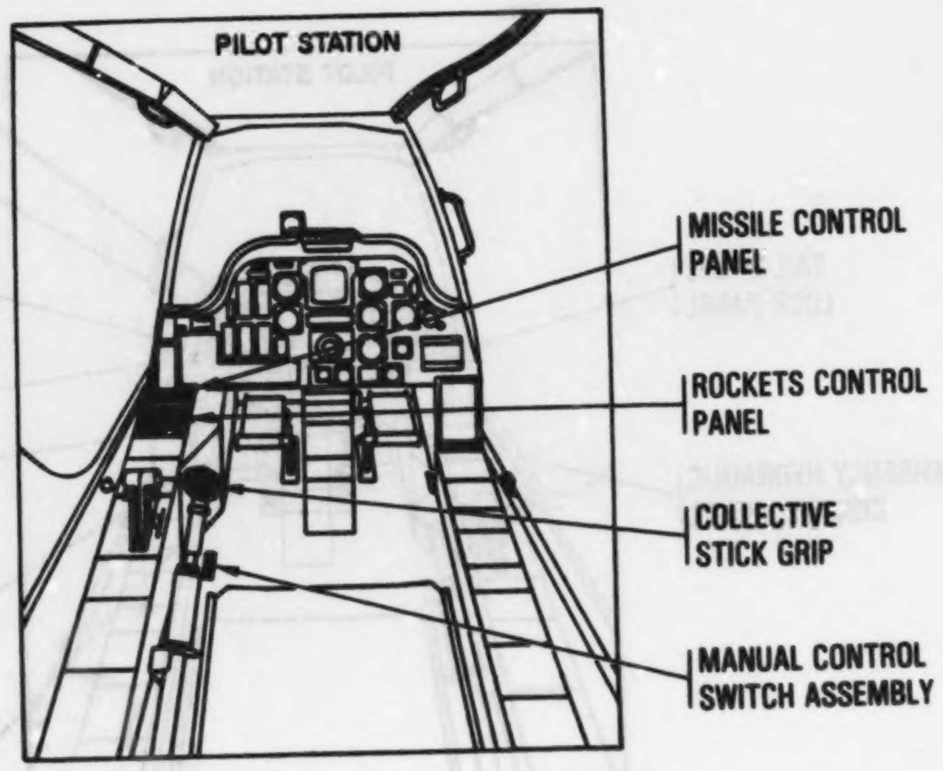
CH. 3 NO. 1


PILOT STATION
REMOTE SELECT TRANSMITTER
IFF CONTROL PANEL
BTL DISCHARGE/APU PANEL

CH. 3 NO. 2


PILOT STATION
REMOTE SELECT TRANSMITTER
VHF AM-FM RECEIVER/ TRANSMITTER
KY-28 SECURE VOICE CONTROL PANEL

CH. 3 NO. 3

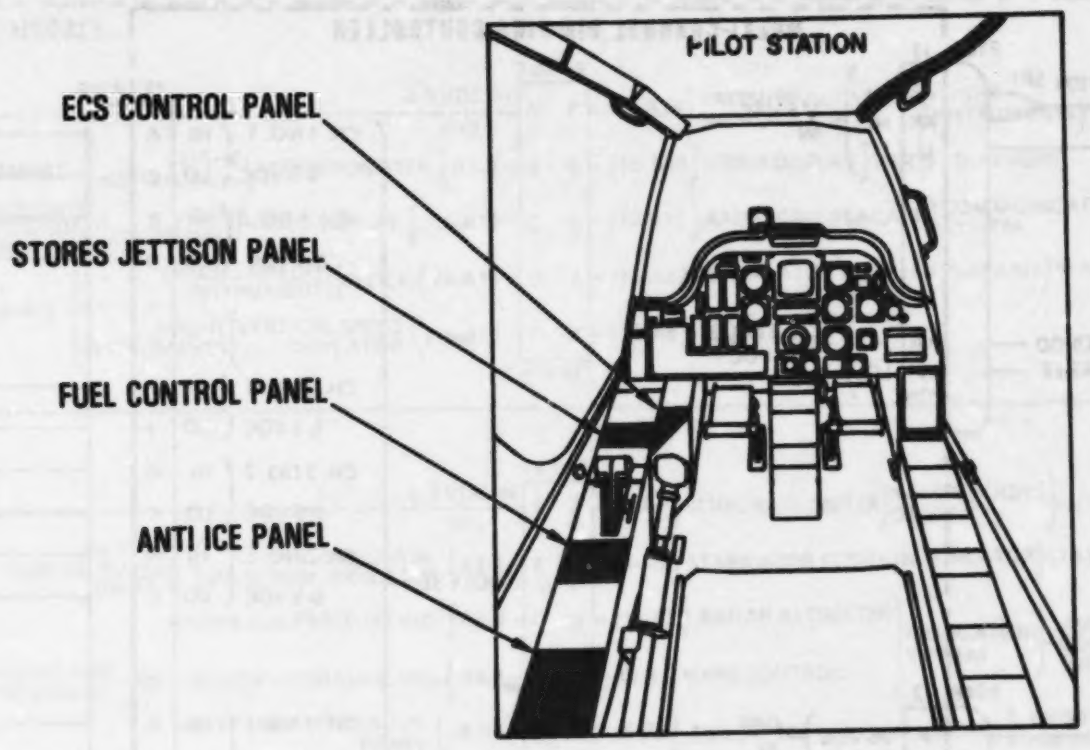

PILOT STATION
MISSILE CONTROL PANEL
ROCKETS CONTROL PANEL
COLLECTIVE STICK GRIP
MANUAL CONTROL SWITCH ASSEMBLY

CH. 4 NO. 1

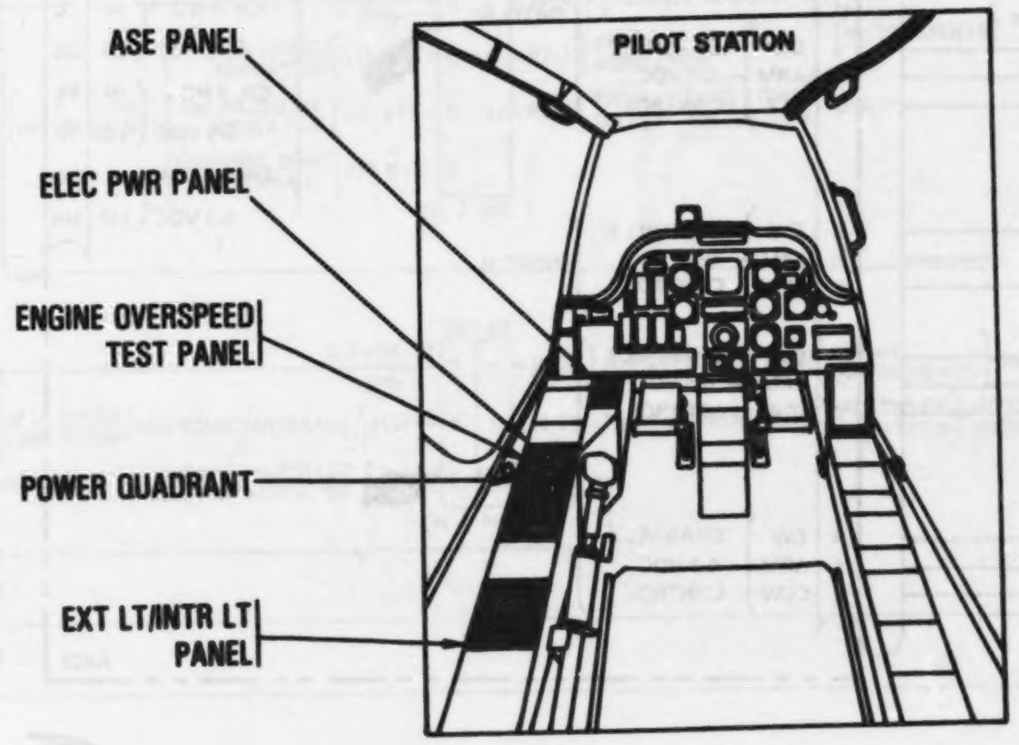
MM04/1-1027-3

GO TO NEXT PAGE

9-13-1. PILOT EDGE-LIGHT - OPERATIONAL CHECK (cont)


PILOT STATION
ECS CONTROL PANEL
STORES JETTISON PANEL
FUEL CONTROL PANEL
ANTI ICE PANEL

CH. 4 NO. 2


PILOT STATION
ASE PANEL
ELEC PWR PANEL
ENGINE OVERSPEED TEST PANEL
POWER QUADRANT
EXT LT/INTR LT PANEL

CH. 4 NO. 4

MM04/1-1027-4

TASK	RESULT
9. Check that all CH. 2, No. 2 indicators are lighted.	If all CH. 2, No. 2 indicators are not lighted, go to para 9-13-11.
10. Check that all CH. 2, No. 3 indicators are lighted.	If all CH. 2, No. 3 indicators are not lighted, go to para 9-13-12.
11. Rotate INST control to OFF. Rotate R/CTR CSL control to BRT. Check that all CH. 3, No. 1 control panel edge-lights are lighted.	If all CH. 3, No. 1 control panels are not lighted, go to para 9-13-13.
12. Check that all CH. 3, No. 2 control panels are lighted.	If all CH. 3, No. 2 control panels are not lighted, go to para 9-13-14.
13. Check that all CH. 3, No. 3 control panels are lighted.	If all CH. 3, No. 3 control panels are not lighted, go to para 9-13-15.
14. Rotate R/CTR CSL control to OFF. Rotate L CSL control to BRT. Check that all CH. 4, No. 1 control panel edge-lights are lighted.	If all CH. 4, No. 1 control panels are not lighted, go to para 9-13-16.
15. Check that all CH. 4, No. 2 control panels are lighted.	If all CH. 4, No. 2 control panels are not lighted, go to para 9-13-17.
16. Check that all CH. 4, No. 4 control panels are lighted.	If all CH. 4, No. 4 control panels are not lighted, go to para 9-13-18.

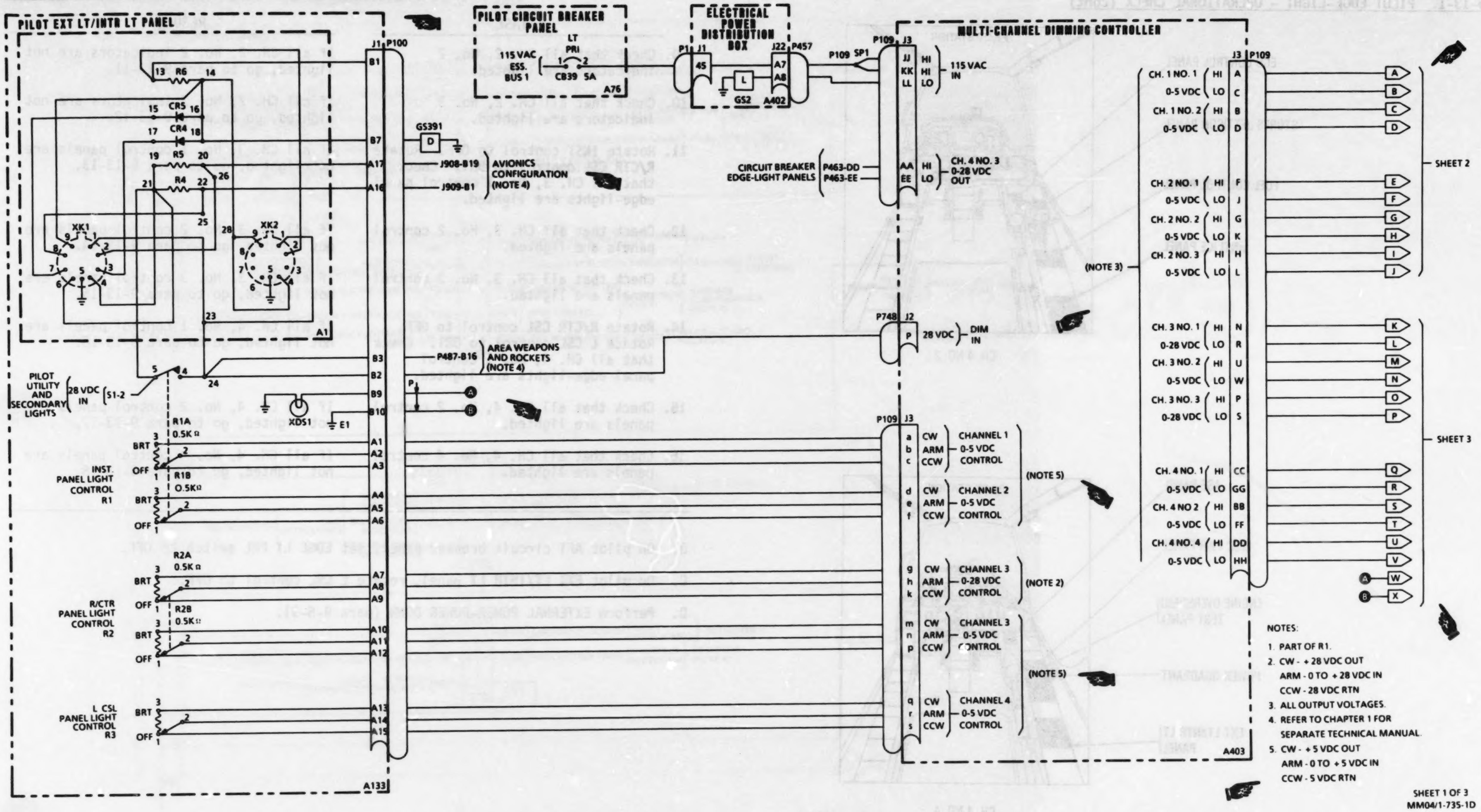
B. On pilot AFT circuit breaker panel, set EDGE LT PNL switch to OFF.

C. On pilot EXT LT/INTR LT panel, rotate L CSL control to OFF.

D. Perform EXTERNAL POWER-POWER DOWN (para 9-5-3).

END OF TASK

9-13-2. PILOT EDGE-LIGHT - INTERCONNECTION DIAGRAM

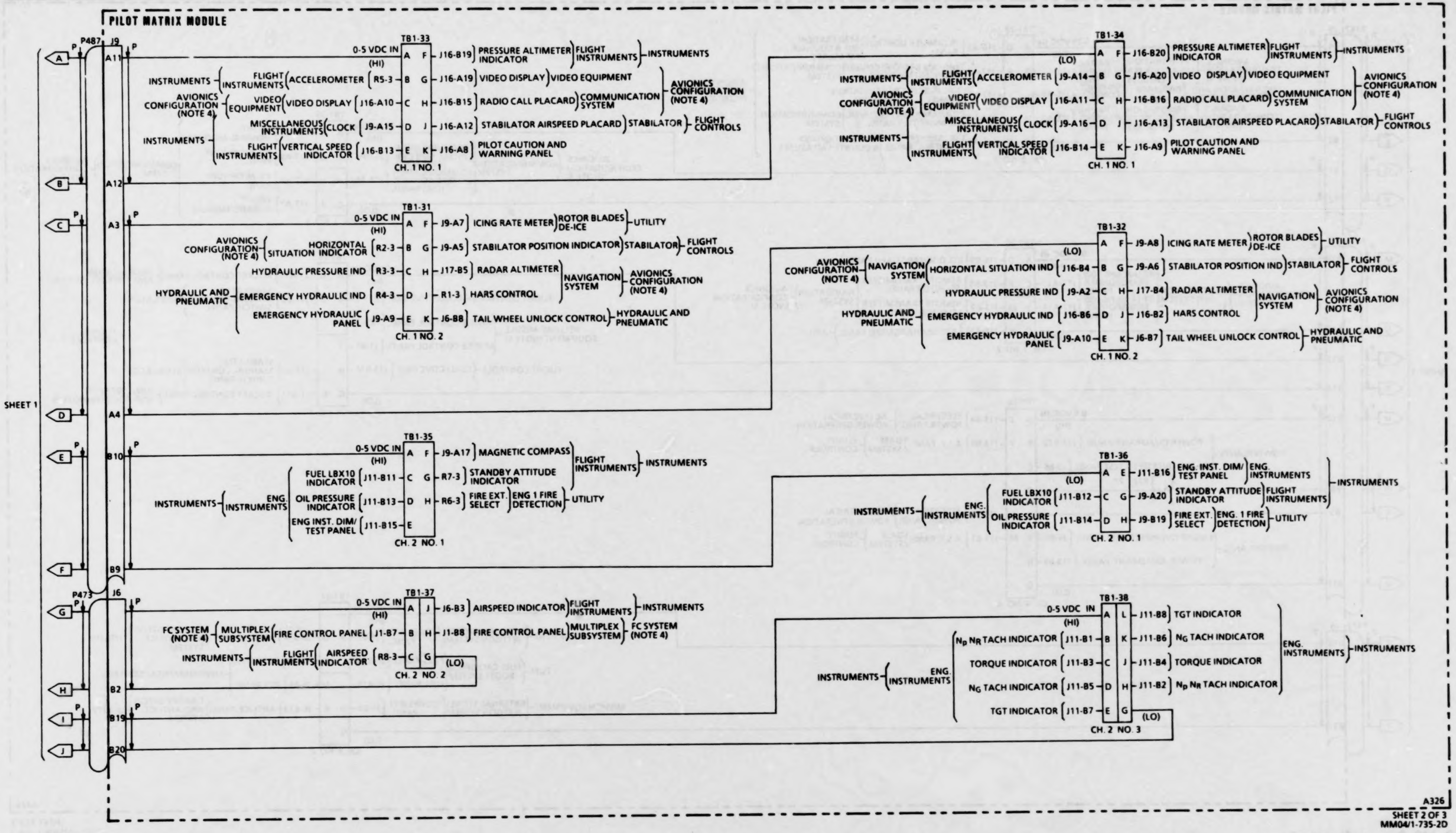

PILOT EXT LT/INTR LT PANEL
R6
CR5
CR4
R5
R4
XK1
XK2
A1
PILOT UTILITY AND SECONDARY LIGHTS
28 VDC IN
S1-2
INST PANEL LIGHT CONTROL R1
R1A 0.5K Ω
R1B 0.5K Ω
R/CTR PANEL LIGHT CONTROL R2
R2A 0.5K Ω
R2B 0.5K Ω
L CSL PANEL LIGHT CONTROL R3
BRT
OFF
A133
J1 P100
GS391
J908-B19
J909-B1
AVIONICS CONFIGURATION (NOTE 4)
P487-B16
AREA WEAPONS AND ROCKETS (NOTE 4)
XDS1
E1
PILOT CIRCUIT BREAKER PANEL
115 VAC ESS. BUS 1
LT PRI
CB39 5A
A76
ELECTRICAL POWER DISTRIBUTION BOX
P16 J1
J22 P457
GS2
A402
P109 SP1
P109 J3
115 VAC IN
CIRCUIT BREAKER EDGE-LIGHT PANELS
P463-DD
P463-EE
CH. 4 NO. 3 0-28 VDC OUT
P748 J2
28 VDC
DIM IN
MULTI-CHANNEL DIMMING CONTROLLER
CW ARM CCW
CHANNEL 1 0-5 VDC CONTROL
CHANNEL 2 0-5 VDC CONTROL
CHANNEL 3 0-28 VDC CONTROL
CHANNEL 3 0-5 VDC CONTROL
CHANNEL 4 0-5 VDC CONTROL
(NOTE 5)
(NOTE 2)
(NOTE 3)
CH. 1 NO. 1
CH. 1 NO. 2
CH. 2 NO. 1
CH. 2 NO. 2
CH. 2 NO. 3
CH. 3 NO. 1
CH. 3 NO. 2
CH. 3 NO. 3
CH. 4 NO. 1
CH. 4 NO. 2
CH. 4 NO. 4
0-5 VDC
0-28 VDC
HI
LO
J3 P109
A403
SHEET 2
SHEET 3

NOTES:

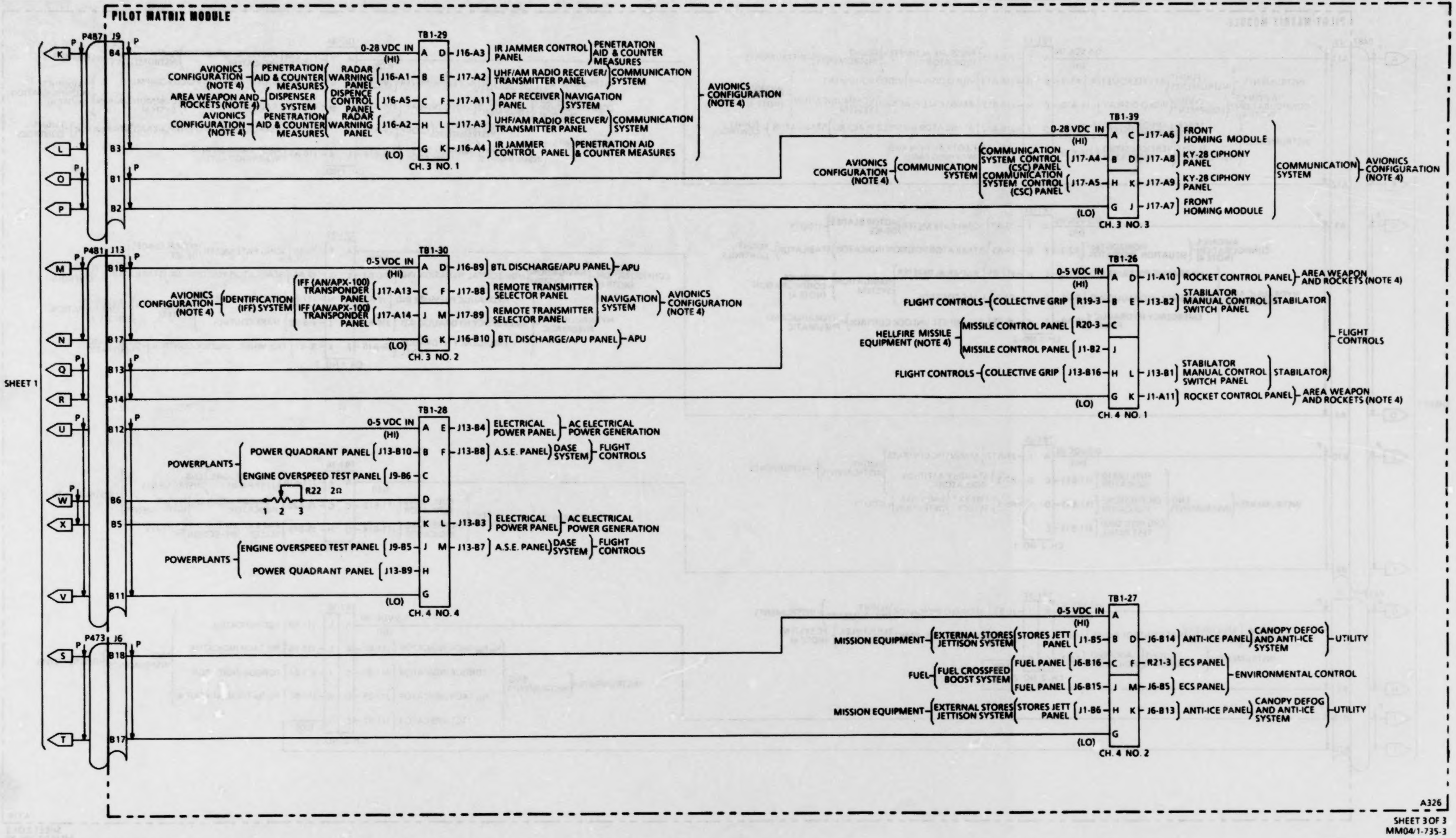
1. PART OF R1.
2. CW - +28 VDC OUT
   ARM - 0 TO +28 VDC IN
   CCW - 28 VDC RTN
3. ALL OUTPUT VOLTAGES.
4. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.
5. CW - +5 VDC OUT
   ARM - 0 TO +5 VDC IN
   CCW - 5 VDC RTN

SHEET 1 OF 3
MM04/1-735-1D

9-13-2. PILOT EDGE-LIGHT - INTERCONNECTION DIAGRAM (cont)

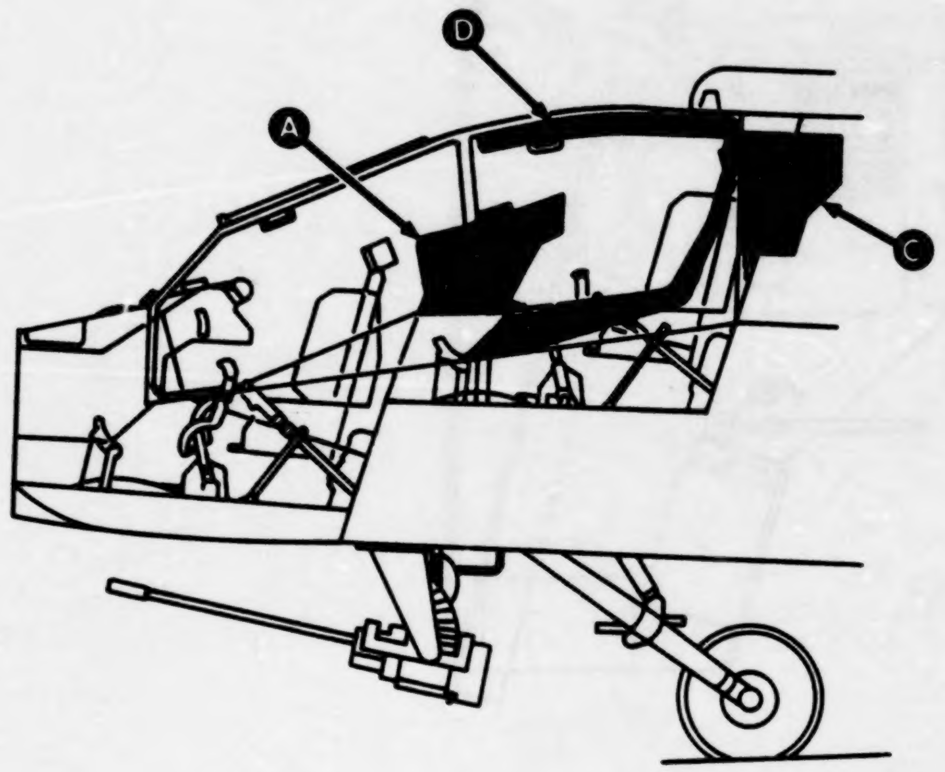

PILOT MATRIX MODULE
P487
J9
P
A11
A12
A3
A4
B10
B9
P473
J6
B2
B19
B20
SHEET 1
A
B
C
D
E
F
G
H
I
J
TB1-33
0-5 VDC IN (HI)
INSTRUMENTS
FLIGHT INSTRUMENTS
ACCELEROMETER
R5-3
AVIONICS CONFIGURATION (NOTE 4)
VIDEO EQUIPMENT
VIDEO DISPLAY
J16-A10
MISCELLANEOUS INSTRUMENTS
CLOCK
J9-A15
VERTICAL SPEED INDICATOR
J16-B13
J16-B19
PRESSURE ALTIMETER INDICATOR
J16-A19
VIDEO DISPLAY
VIDEO EQUIPMENT
J16-B15
RADIO CALL PLACARD
COMMUNICATION SYSTEM
J16-A12
STABILATOR AIRSPEED PLACARD
STABILATOR
FLIGHT CONTROLS
J16-A8
PILOT CAUTION AND WARNING PANEL
CH. 1 NO. 1
TB1-34
(LO)
J9-A14
J16-A11
J9-A16
J16-B14
J16-B20
J16-A20
J16-B16
J16-A13
J16-A9
TB1-31
HORIZONTAL SITUATION INDICATOR
R2-3
HYDRAULIC PRESSURE IND
R3-3
HYDRAULIC AND PNEUMATIC
EMERGENCY HYDRAULIC IND
R4-3
EMERGENCY HYDRAULIC PANEL
J9-A9
J9-A7
ICING RATE METER
ROTOR BLADES DE-ICE
UTILITY
J9-A5
STABILATOR POSITION INDICATOR
J17-B5
RADAR ALTIMETER
NAVIGATION SYSTEM
R1-3
HARS CONTROL
J6-B8
TAIL WHEEL UNLOCK CONTROL
CH. 1 NO. 2
TB1-32
NAVIGATION SYSTEM
HORIZONTAL SITUATION IND
J16-B4
J9-A2
J16-B6
J9-A10
J9-A8
J9-A6
STABILATOR POSITION IND
J17-B4
J16-B2
J6-B7
TB1-35
J9-A17
MAGNETIC COMPASS
STANDBY ATTITUDE INDICATOR
R7-3
FUEL LBX10 INDICATOR
J11-B11
ENG. INSTRUMENTS
OIL PRESSURE INDICATOR
J11-B13
R6-3
FIRE EXT. SELECT
ENG 1 FIRE DETECTION
ENG INST. DIM/TEST PANEL
J11-B15
CH. 2 NO. 1
TB1-36
J11-B16
ENG. INST. DIM/TEST PANEL
ENG. INSTRUMENTS
J11-B12
J9-A20
J11-B14
J9-B19
TB1-37
FC SYSTEM (NOTE 4)
MULTIPLEX SUBSYSTEM
FIRE CONTROL PANEL
J1-B7
AIRSPEED INDICATOR
R8-3
J6-B3
J1-B8
CH. 2 NO. 2
TB1-38
NP NR TACH INDICATOR
J11-B1
TORQUE INDICATOR
J11-B3
NG TACH INDICATOR
J11-B5
TGT INDICATOR
J11-B7
J11-B8
J11-B6
J11-B4
J11-B2
CH. 2 NO. 3
A326
SHEET 2 OF 3
MM04/1-735-2D

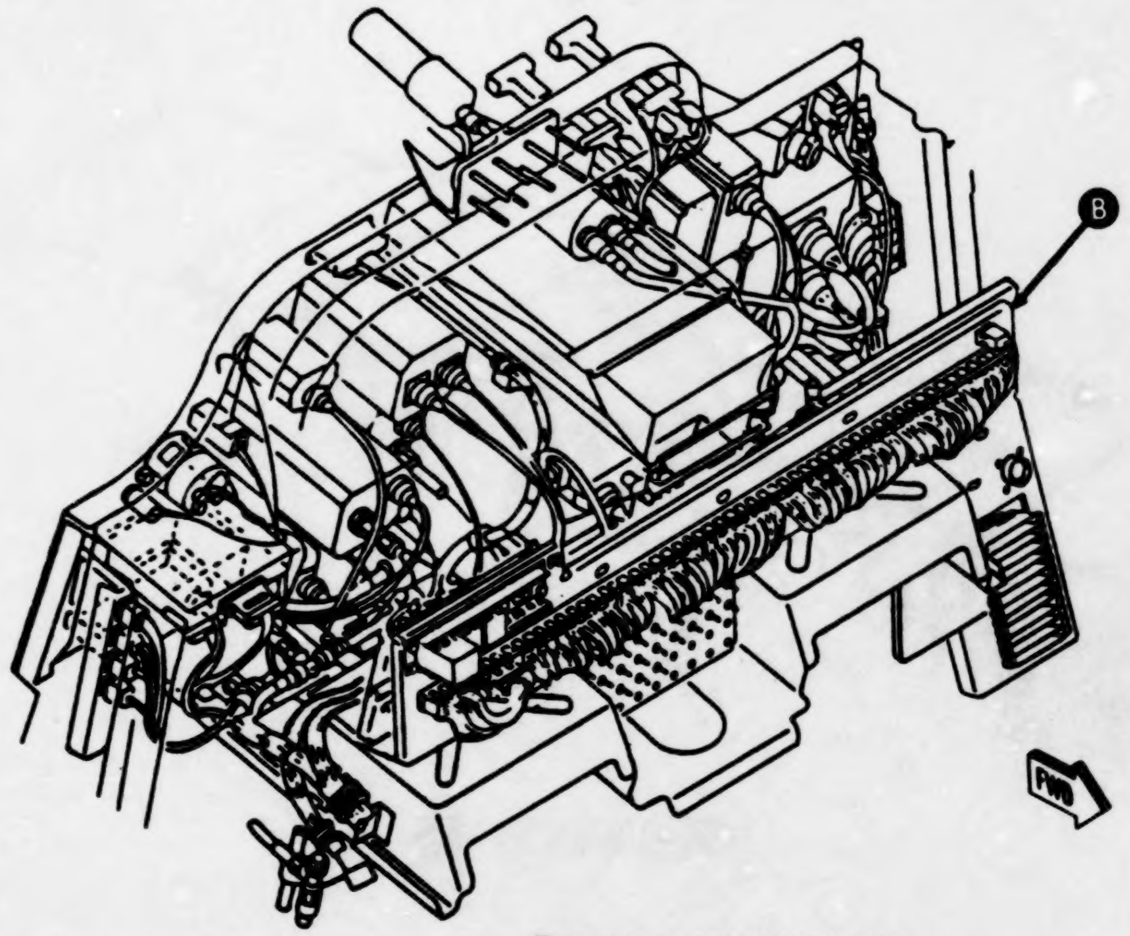
9-13-2. PILOT EDGE-LIGHT - INTERCONNECTION DIAGRAM (cont)


PILOT MATRIX MODULE
SHEET 1
K
L
O
P
M
N
Q
R
U
W
X
V
S
T
P487 J9
B4
B3
B1
B2
P481 J13
B18
B17
B13
B14
B12
B6
B5
B11
P473 J6
B18
B17
P
TB1-29
0-28 VDC IN (HI)
(LO)
CH. 3 NO. 1
J16-A3 IR JAMMER CONTROL PANEL PENETRATION AID & COUNTER MEASURES
AVIONICS CONFIGURATION (NOTE 4) PENETRATION AID & COUNTER MEASURES RADAR WARNING PANEL J16-A1
J17-A2 UHF/AM RADIO RECEIVER/ TRANSMITTER PANEL COMMUNICATION SYSTEM
AREA WEAPON AND ROCKETS (NOTE 4) DISPENSER SYSTEM DISPENCE CONTROL PANEL J16-A5
J17-A11 ADF RECEIVER PANEL NAVIGATION SYSTEM
AVIONICS CONFIGURATION (NOTE 4) PENETRATION AID & COUNTER MEASURES RADAR WARNING PANEL J16-A2
J17-A3 UHF/AM RADIO RECEIVER/ TRANSMITTER PANEL COMMUNICATION SYSTEM
J16-A4 IR JAMMER CONTROL PANEL PENETRATION AID & COUNTER MEASURES
AVIONICS CONFIGURATION (NOTE 4)
TB1-30
0-5 VDC IN (HI)
(LO)
CH. 3 NO. 2
J16-B9 BTL DISCHARGE/APU PANEL APU
AVIONICS CONFIGURATION (NOTE 4) IDENTIFICATION (IFF) SYSTEM IFF (AN/APX-100) TRANSPONDER PANEL J17-A13
J17-B8 REMOTE TRANSMITTER SELECTOR PANEL
IFF (AN/APX-100) TRANSPONDER PANEL J17-A14
J17-B9 REMOTE TRANSMITTER SELECTOR PANEL
NAVIGATION SYSTEM AVIONICS CONFIGURATION (NOTE 4)
J16-B10 BTL DISCHARGE/APU PANEL APU
TB1-28
0-5 VDC IN (HI)
(LO)
CH. 4 NO. 4
J13-B4 ELECTRICAL POWER PANEL AC ELECTRICAL POWER GENERATION
POWERPLANTS POWER QUADRANT PANEL J13-B10
J13-B8 A.S.E. PANEL DASE SYSTEM FLIGHT CONTROLS
ENGINE OVERSPEED TEST PANEL J9-B6
R22 2Ω
1 2 3
J13-B3 ELECTRICAL POWER PANEL AC ELECTRICAL POWER GENERATION
POWERPLANTS ENGINE OVERSPEED TEST PANEL J9-B5
J13-B7 A.S.E. PANEL DASE SYSTEM FLIGHT CONTROLS
POWER QUADRANT PANEL J13-B9
TB1-39
0-28 VDC IN (HI)
(LO)
CH. 3 NO. 3
J17-A6 FRONT HOMING MODULE
AVIONICS CONFIGURATION (NOTE 4) COMMUNICATION SYSTEM COMMUNICATION SYSTEM CONTROL (CSC) PANEL J17-A4
J17-A8 KY-28 CIPHONY PANEL
COMMUNICATION SYSTEM CONTROL (CSC) PANEL J17-A5
J17-A9 KY-28 CIPHONY PANEL
J17-A7 FRONT HOMING MODULE
COMMUNICATION SYSTEM AVIONICS CONFIGURATION (NOTE 4)
TB1-26
0-5 VDC IN (HI)
(LO)
CH. 4 NO. 1
J1-A10 ROCKET CONTROL PANEL AREA WEAPON AND ROCKETS (NOTE 4)
FLIGHT CONTROLS COLLECTIVE GRIP R19-3
J13-B2 STABILATOR MANUAL CONTROL SWITCH PANEL STABILATOR
HELLFIRE MISSILE EQUIPMENT (NOTE 4) MISSILE CONTROL PANEL R20-3
MISSILE CONTROL PANEL J1-B2
FLIGHT CONTROLS COLLECTIVE GRIP J13-B16
J13-B1 STABILATOR MANUAL CONTROL SWITCH PANEL STABILATOR
FLIGHT CONTROLS
J1-A11 ROCKET CONTROL PANEL AREA WEAPON AND ROCKETS (NOTE 4)
TB1-27
0-5 VDC IN (HI)
(LO)
CH. 4 NO. 2
MISSION EQUIPMENT EXTERNAL STORES JETTISON SYSTEM STORES JETT PANEL J1-B5
J6-B14 ANTI-ICE PANEL CANOPY DEFOG AND ANTI-ICE SYSTEM UTILITY
FUEL FUEL CROSSFEED BOOST SYSTEM FUEL PANEL J6-B16
R21-3 ECS PANEL
FUEL PANEL J6-B15
J6-B5 ECS PANEL
ENVIRONMENTAL CONTROL
MISSION EQUIPMENT EXTERNAL STORES JETTISON SYSTEM STORES JETT PANEL J1-B6
J6-B13 ANTI-ICE PANEL CANOPY DEFOG AND ANTI-ICE SYSTEM UTILITY
A B C D E F G H J K L M
A326

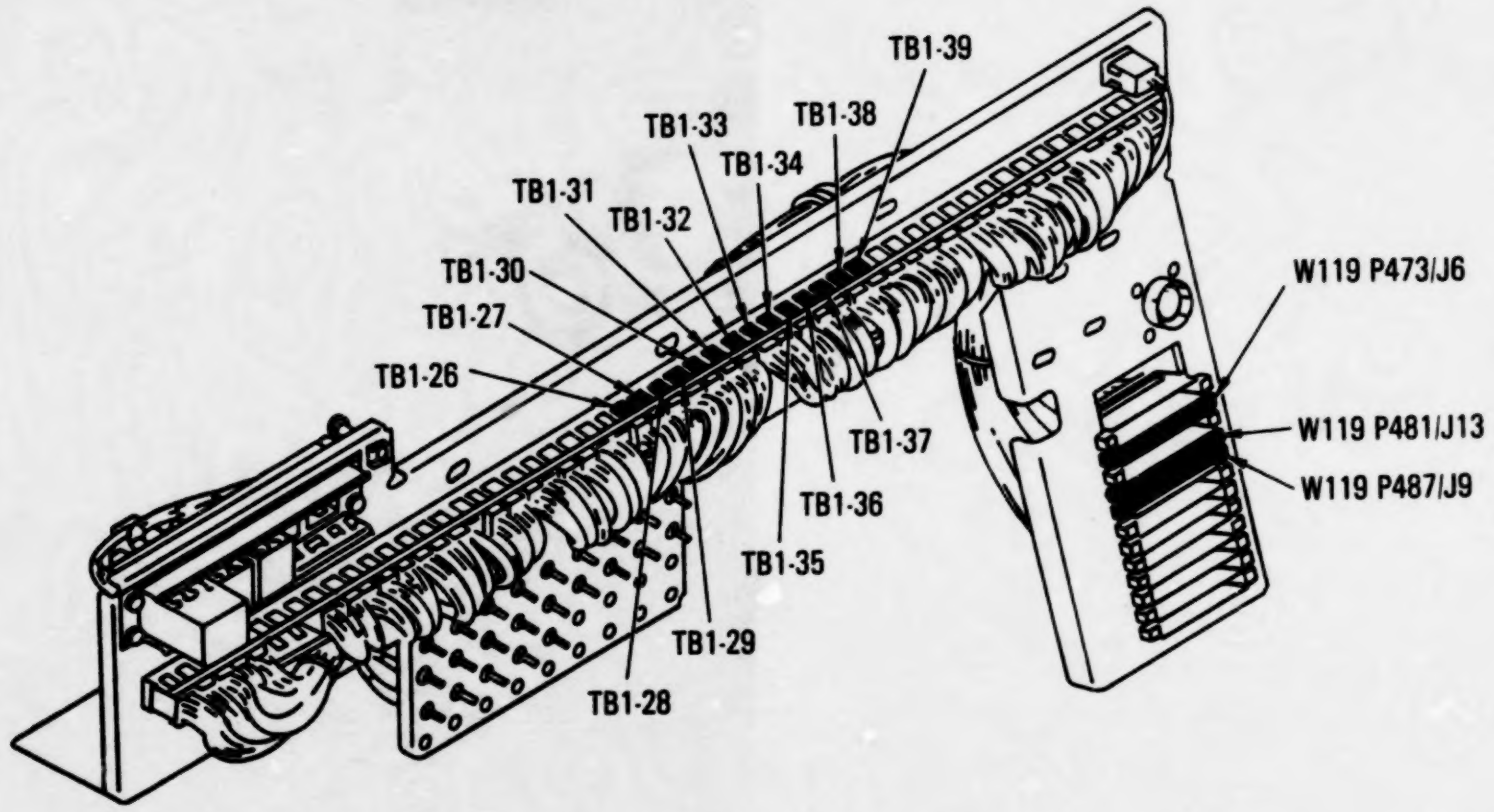
SHEET 3 OF 3
MM04/1-735-3

9-13-3. PILOT EDGE-LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION





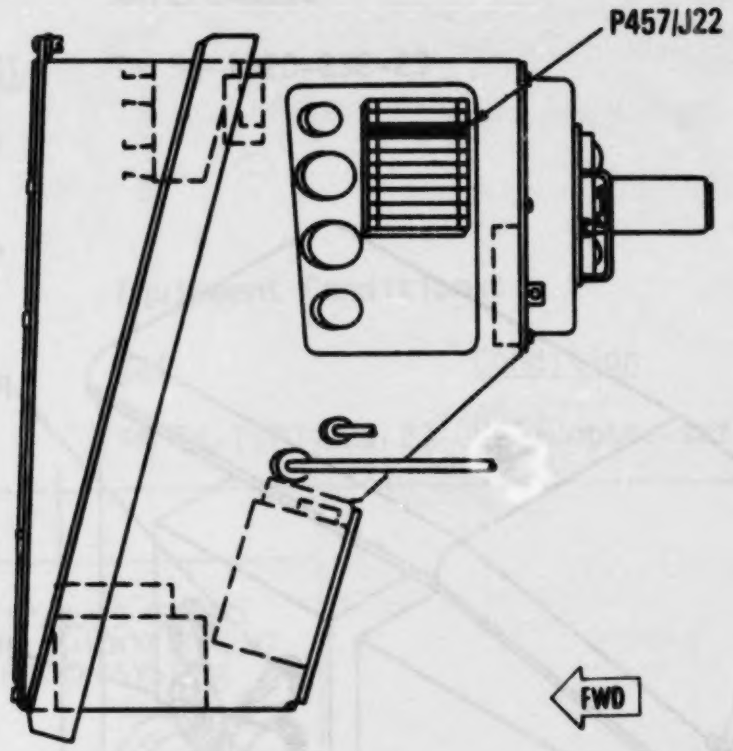
A PILOT INSTRUMENT PANEL


TB1-39
TB1-33
TB1-38
TB1-34
TB1-31
TB1-32
TB1-30
TB1-27
TB1-26
W119 P473/J6
W119 P481/J13
W119 P487/J9
TB1-37
TB1-36
TB1-35
TB1-29
TB1-28

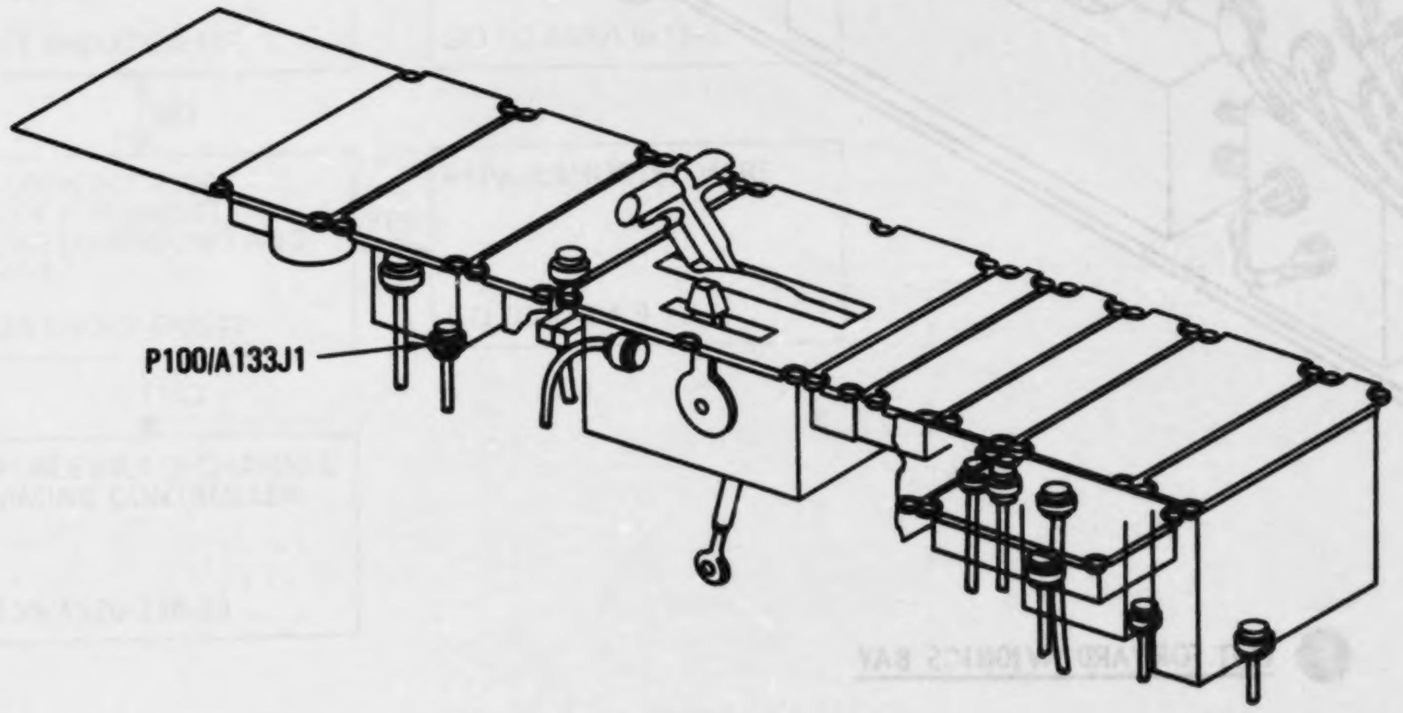
B PILOT MATRIX MODULE

MM04/1-1287-1

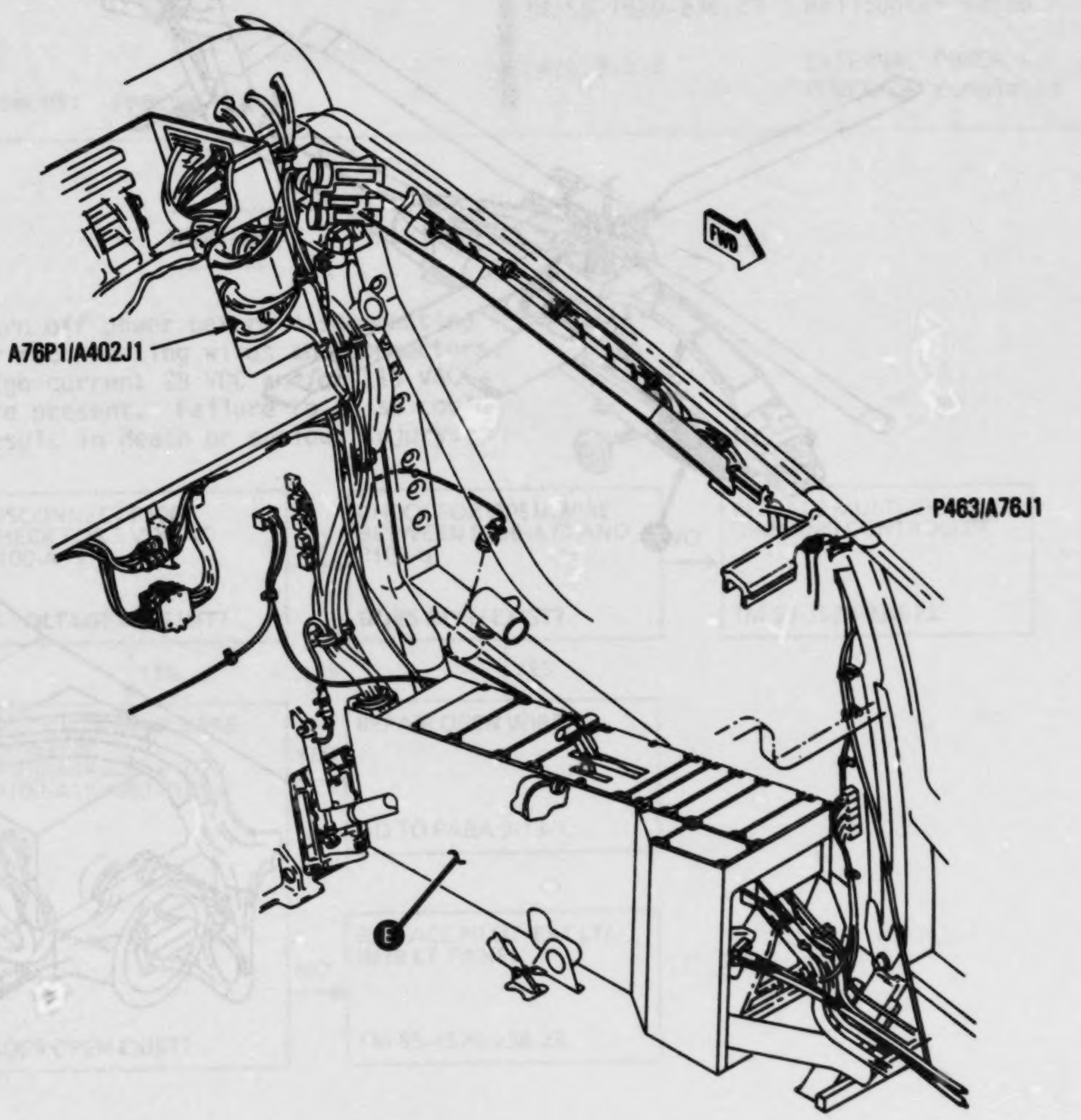
9-13-3. PILOT EDGE-LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


P457/J22
FWD

C ELECTRICAL POWER CENTER


P100/A133J1

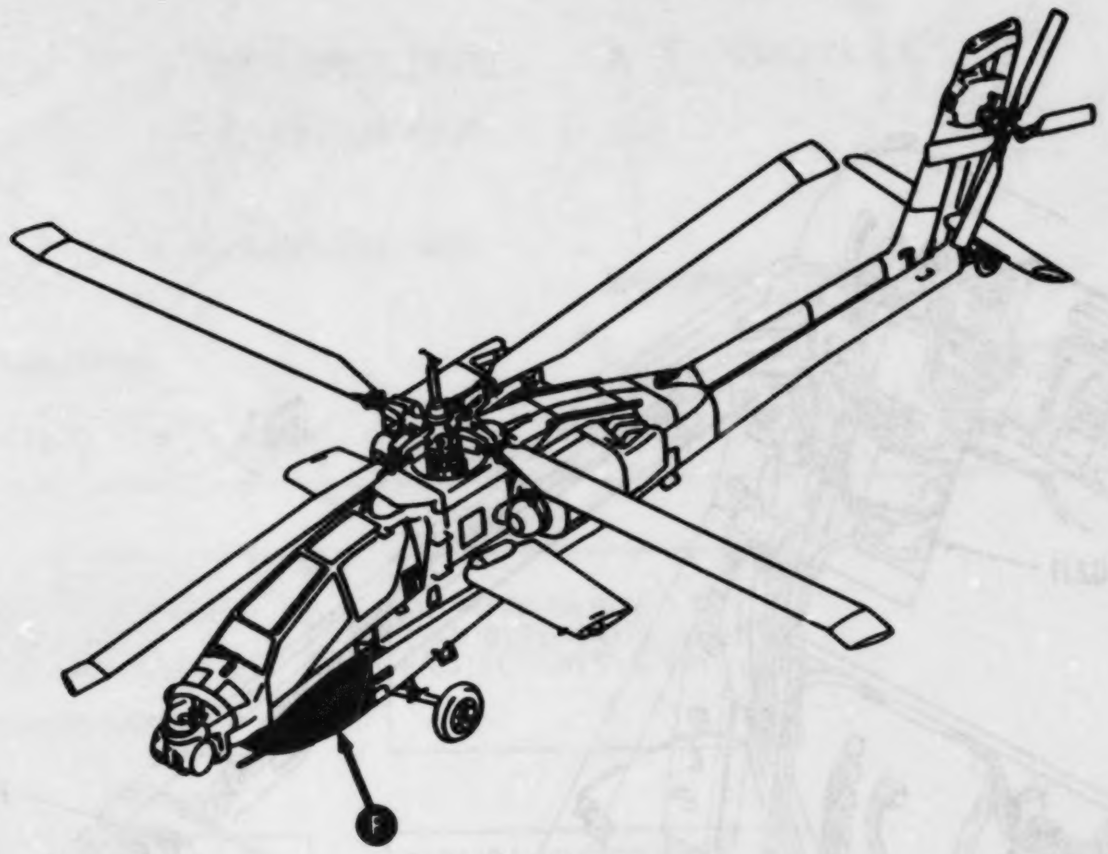
E PILOT LEFT CONSOLE

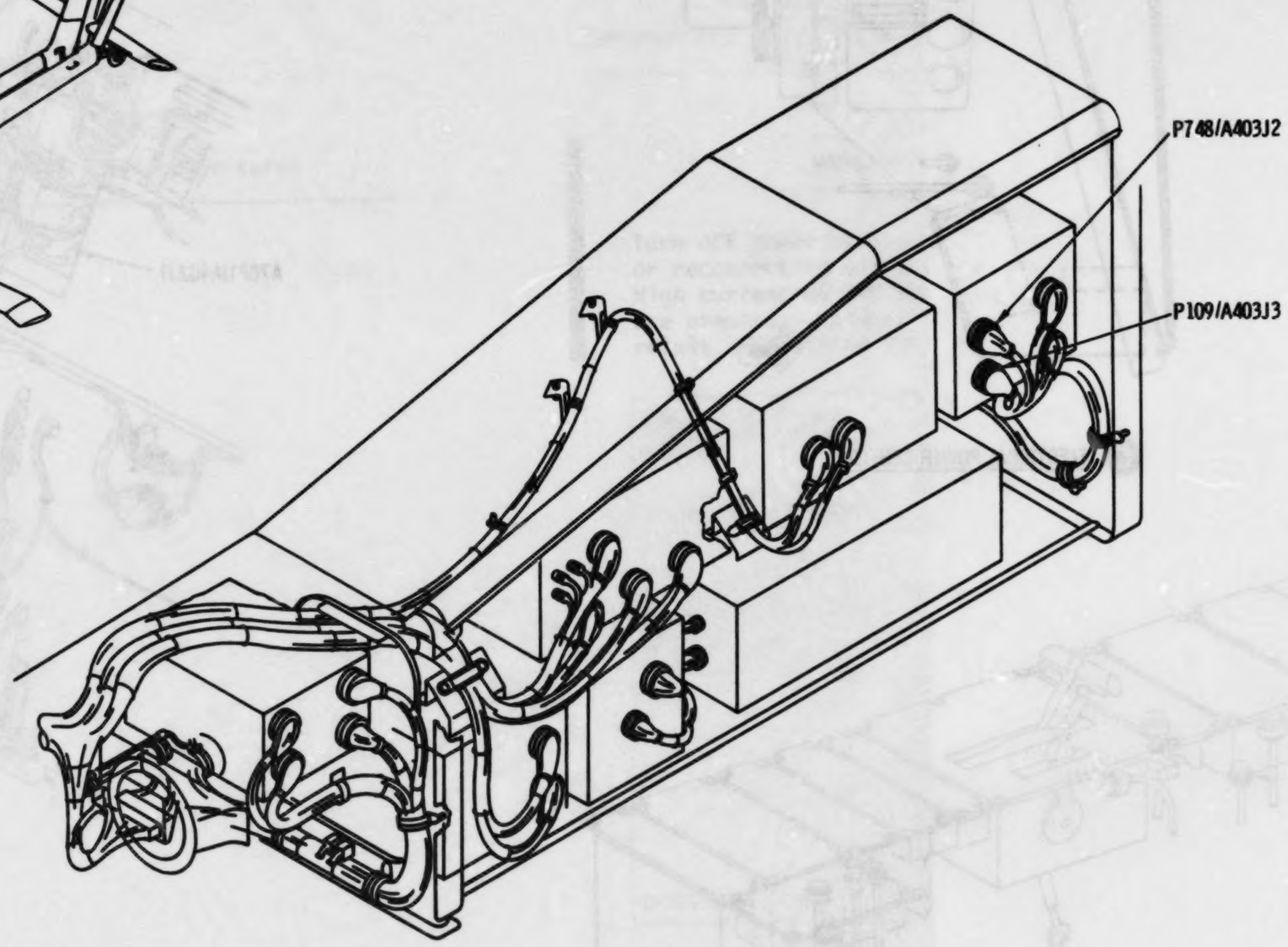

A76P1/A402J1
FWD
P463/A76J1
E

D PILOT STATION

MM04/1-1287-2

9-13-3. PILOT EDGE-LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)




P748/A403J2
P109/A403J3

F LEFT FORWARD AVIONICS BAY

9-13-4. PILOT LT PRI CIRCUIT BREAKER (CB39) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

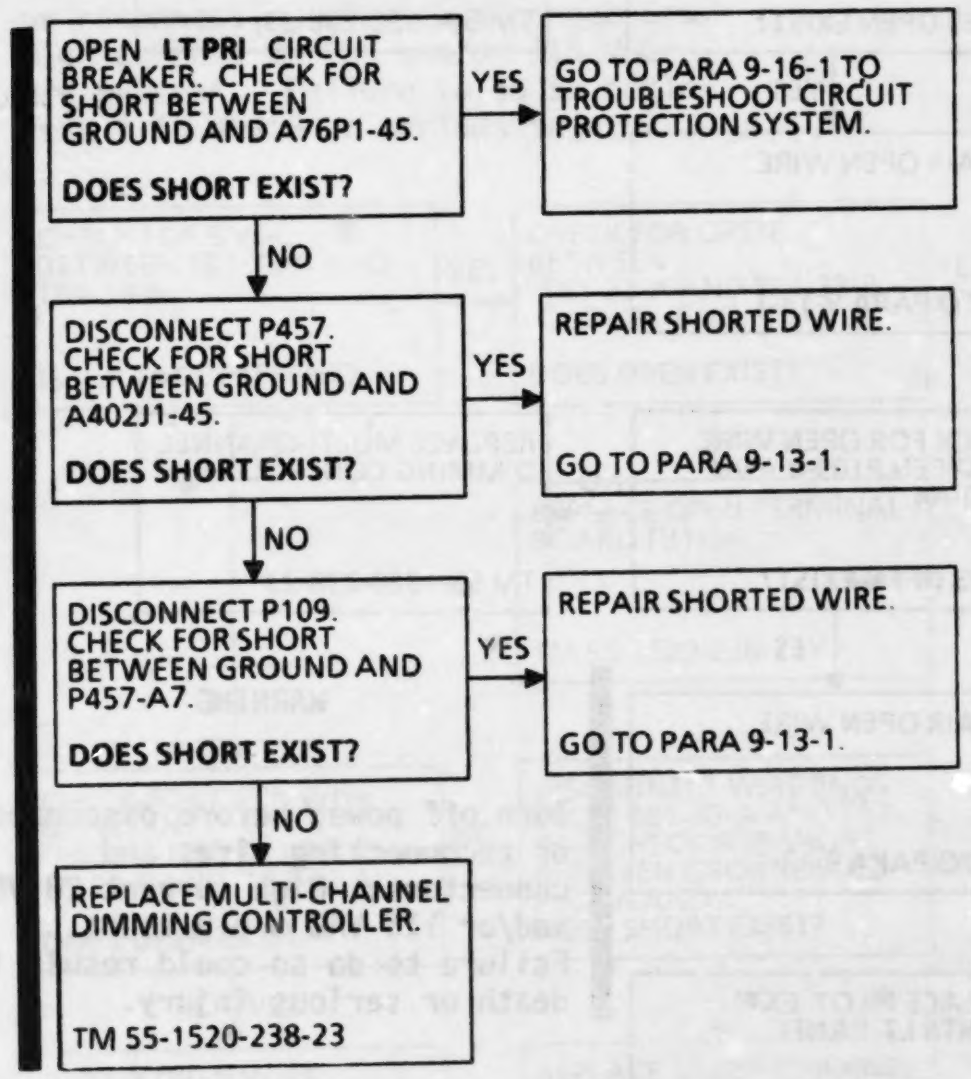
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN LT PRI CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76P1-45.
DOES SHORT EXIST?
YES
GO TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT P457. CHECK FOR SHORT BETWEEN GROUND AND A402J1-45.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT P109. CHECK FOR SHORT BETWEEN GROUND AND P457-A7.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23

END OF TASK

9-13-5. ALL PILOT LEFT CONSOLE EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools: (para 9-13-4)

Personnel Required: (para 9-13-4)

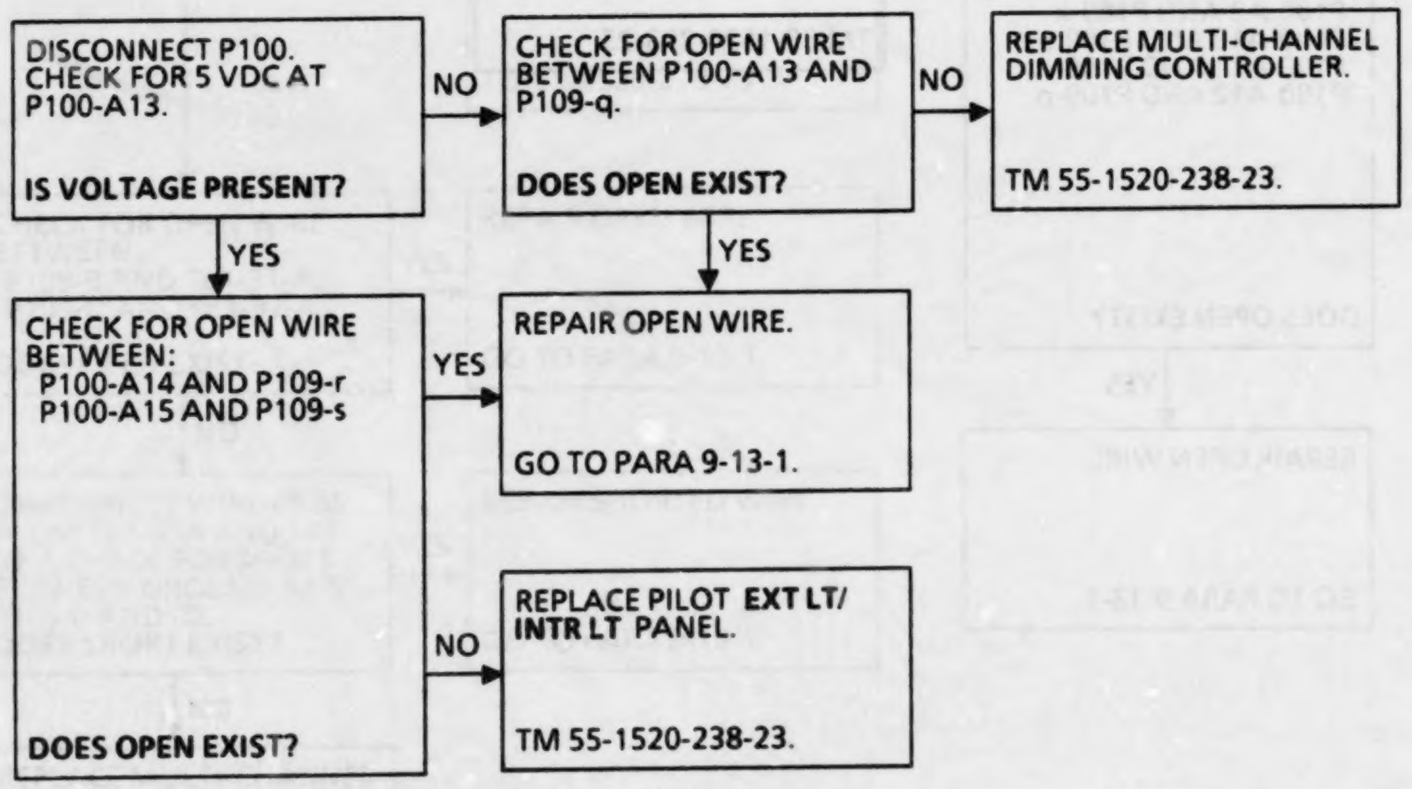
References: (para 9-13-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P100. CHECK FOR 5 VDC AT P100-A13.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN P100-A13 AND P109-q.
DOES OPEN EXIST?
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
YES
CHECK FOR OPEN WIRE BETWEEN:
P100-A14 AND P109-r
P100-A15 AND P109-s
DOES OPEN EXIST?
YES
NO
REPLACE PILOT EXT LT/ INTR LT PANEL.
TM 55-1520-238-23.

END OF TASK

9-13-6. ALL PILOT RIGHT AND CENTER CONSOLE EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

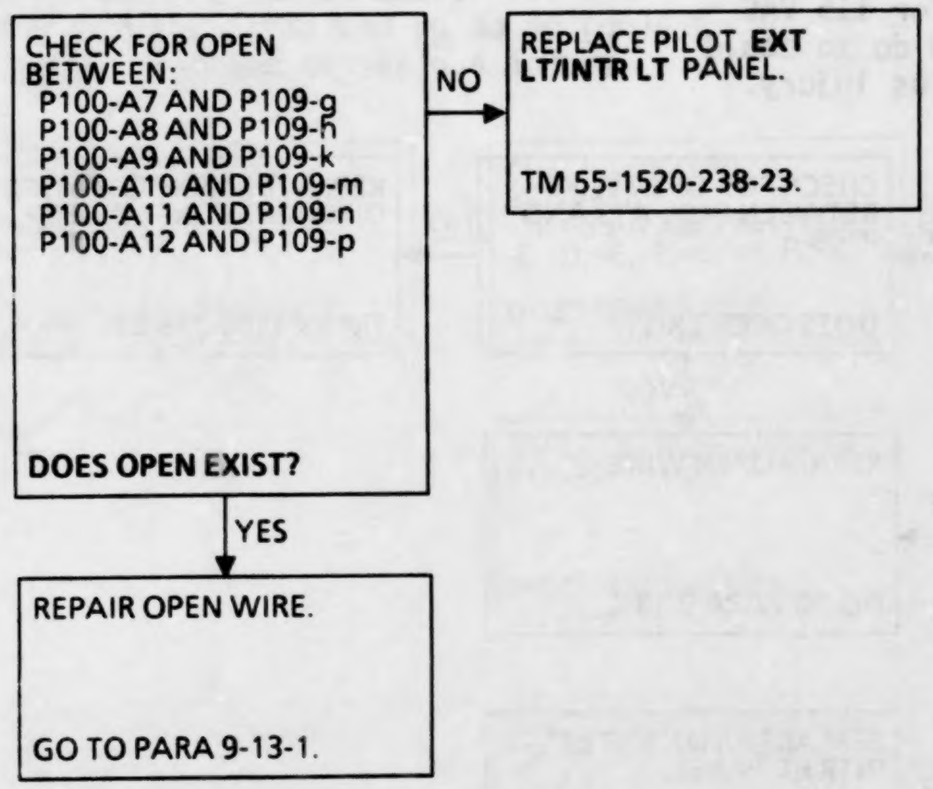
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - Door L90 opened


CHECK FOR OPEN BETWEEN:
P100-A7 AND P109-g
P100-A8 AND P109-h
P100-A9 AND P109-k
P100-A10 AND P109-m
P100-A11 AND P109-n
P100-A12 AND P109-p
DOES OPEN EXIST?
NO
REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.

END OF TASK

9-13-7. ALL PILOT INSTRUMENT EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools: (para 9-13-6)

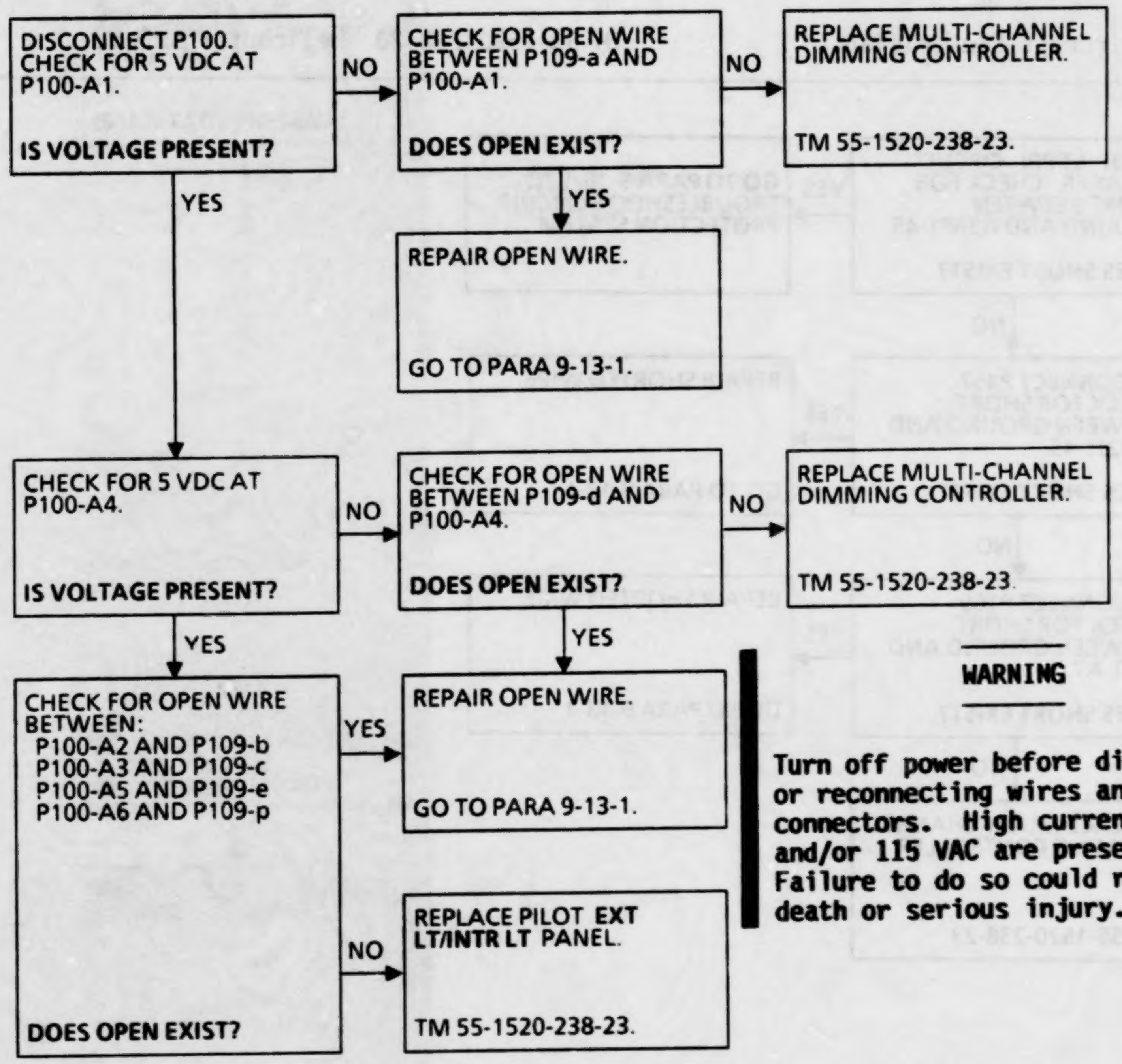
Personnel Required: (para 9-13-6)

References: (para 9-13-6)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 1-3-2	ICS connected
Para 9-5-2	EXTERNAL POWER - POWER UP complete

REFER TO VOLTAGE WARNING


DISCONNECT P100. CHECK FOR 5 VDC AT P100-A1.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN P109-a AND P100-A1.
DOES OPEN EXIST?
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
YES
CHECK FOR 5 VDC AT P100-A4.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN P109-d AND P100-A4.
DOES OPEN EXIST?
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
YES
CHECK FOR OPEN WIRE BETWEEN:
P100-A2 AND P109-b
P100-A3 AND P109-c
P100-A5 AND P109-e
P100-A6 AND P109-p
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-13-8. ALL CH. 1 NO. 1 EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools: (para 9-13-6)

Personnel Required: (para 9-13-6)

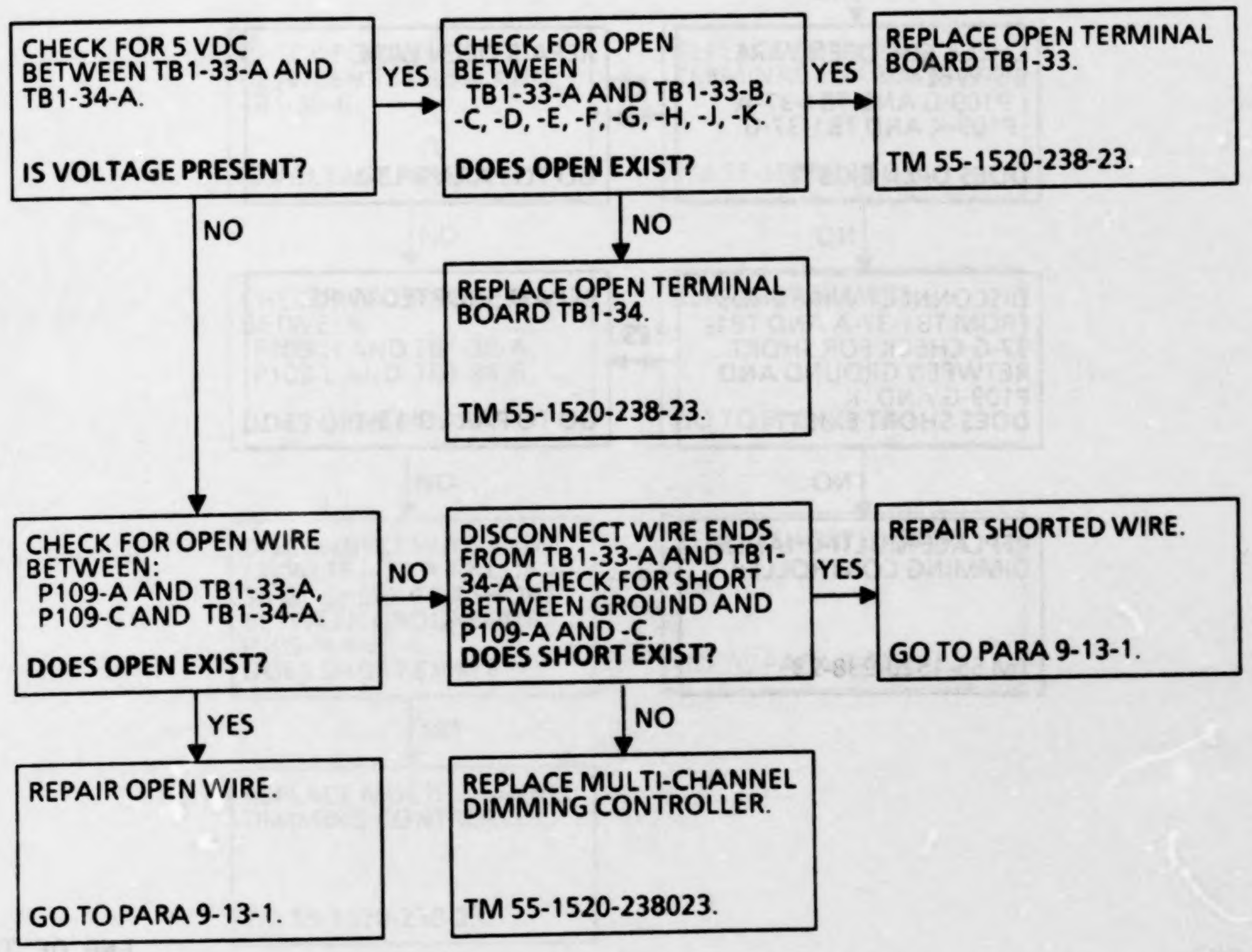
References: (para 9-13-6)

Equipment Condition:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Nontransparent barrier removed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 5 VDC BETWEEN TB1-33-A AND TB1-34-A.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-33-A AND TB1-33-B, -C, -D, -E, -F, -G, -H, -J, -K.
DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB1-33.
TM 55-1520-238-23.
NO
REPLACE OPEN TERMINAL BOARD TB1-34.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P109-A AND TB1-33-A, P109-C AND TB1-34-A.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-33-A AND TB1-34-A CHECK FOR SHORT BETWEEN GROUND AND P109-A AND -C.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238023.

9-13-9. ALL CH. 1 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-6)

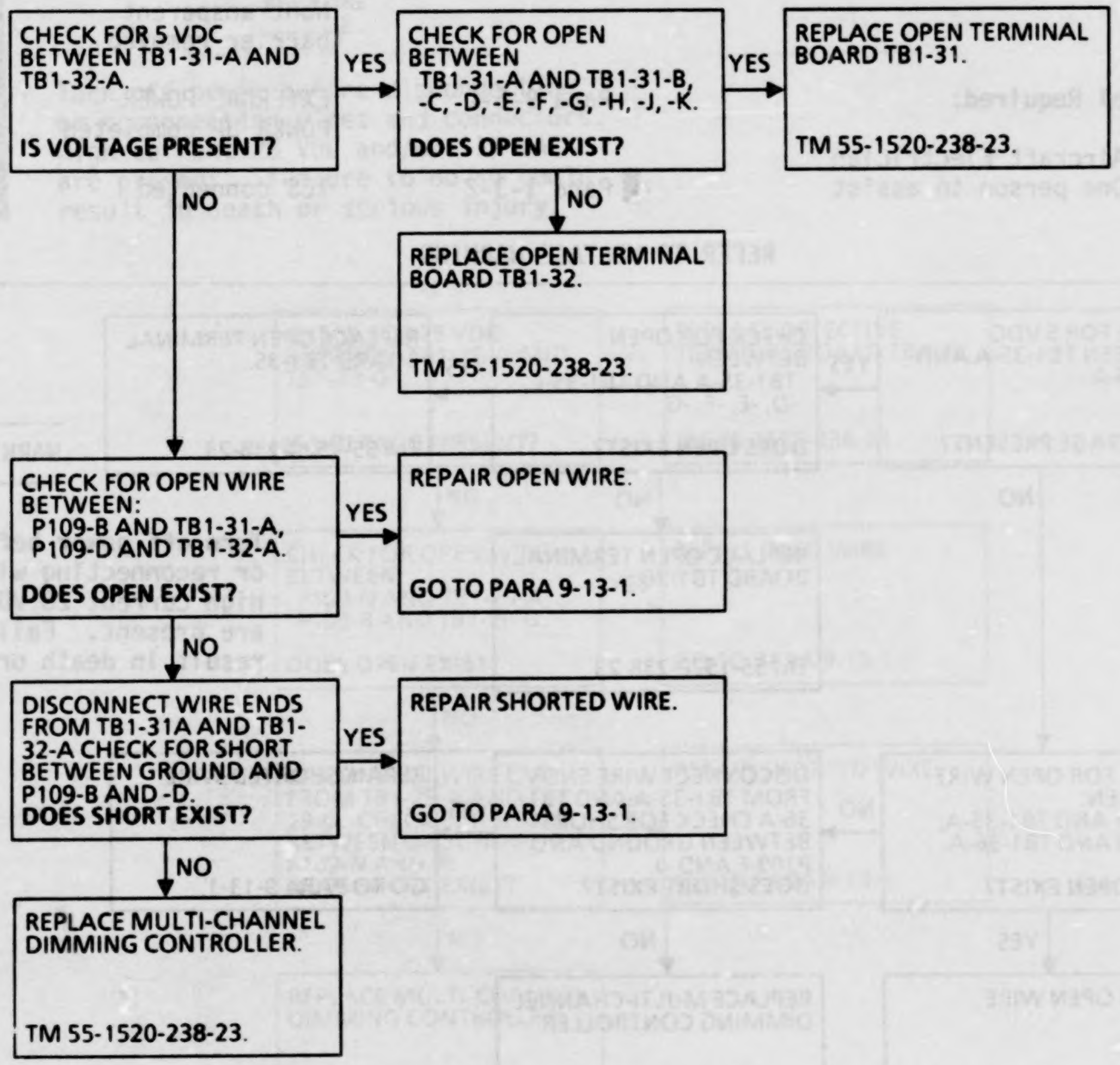
Personnel Required: (para 9-13-6)

References: (para 9-13-6)

Equipment Conditions: (para 9-13-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 5 VDC BETWEEN TB1-31-A AND TB1-32-A.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-31-A AND TB1-31-B, -C, -D, -E, -F, -G, -H, -J, -K.
DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB1-31.
TM 55-1520-238-23.
NO
REPLACE OPEN TERMINAL BOARD TB1-32.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P109-B AND TB1-31-A, P109-D AND TB1-32-A.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-31A AND TB1-32-A CHECK FOR SHORT BETWEEN GROUND AND P109-B AND -D.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

9-13-10. ALL CH. 2 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

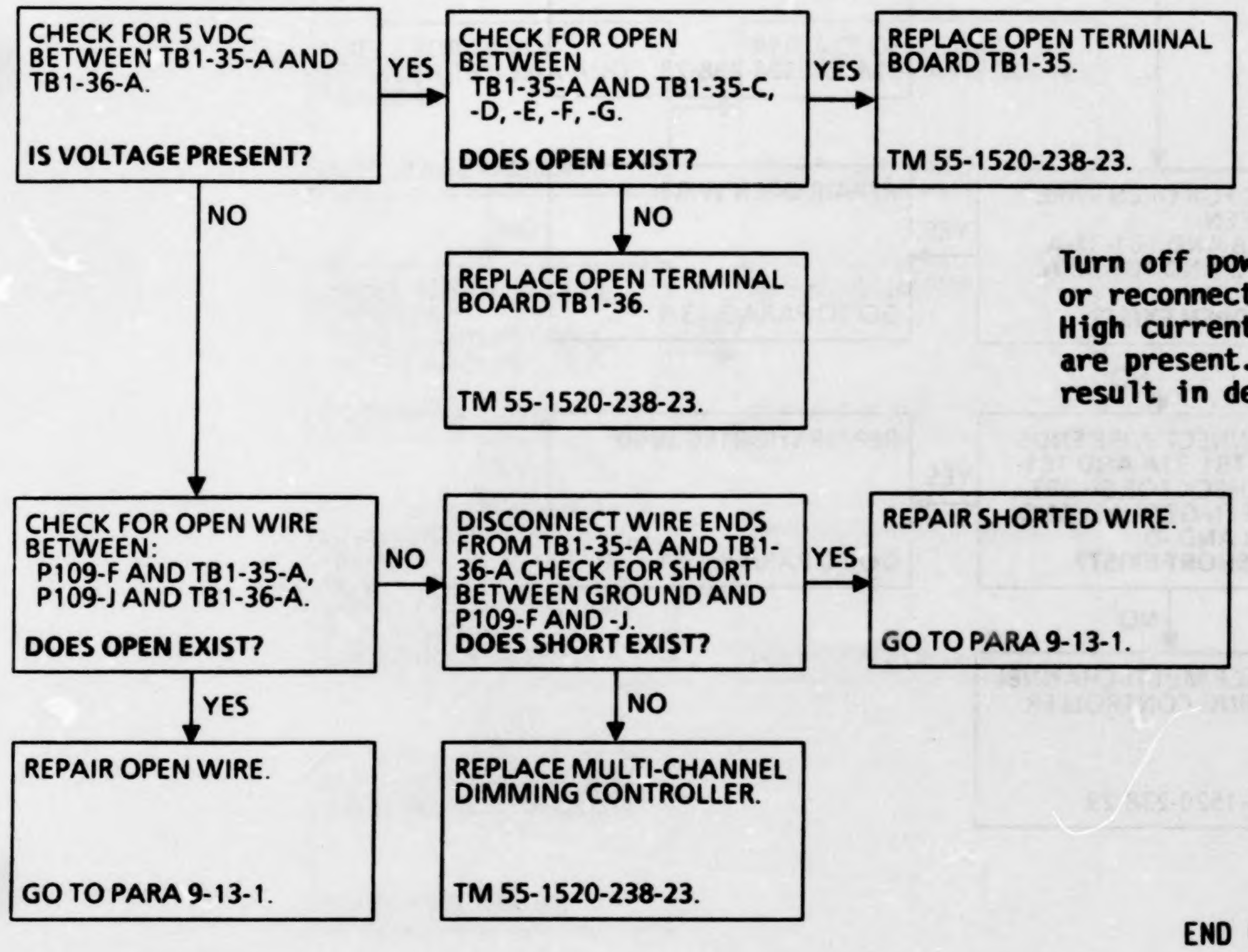
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

REFER TO VOLTAGE WARNING


CHECK FOR 5 VDC BETWEEN TB1-35-A AND TB1-36-A.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-35-A AND TB1-35-C, -D, -E, -F, -G.
DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB1-35.
TM 55-1520-238-23.
NO
REPLACE OPEN TERMINAL BOARD TB1-36.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P109-F AND TB1-35-A, P109-J AND TB1-36-A.
DOES OPEN EXIST?
NO
DISCONNECT WIRE ENDS FROM TB1-35-A AND TB1-36-A CHECK FOR SHORT BETWEEN GROUND AND P109-F AND -J.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-13-11. ALL CH. 2 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-10)

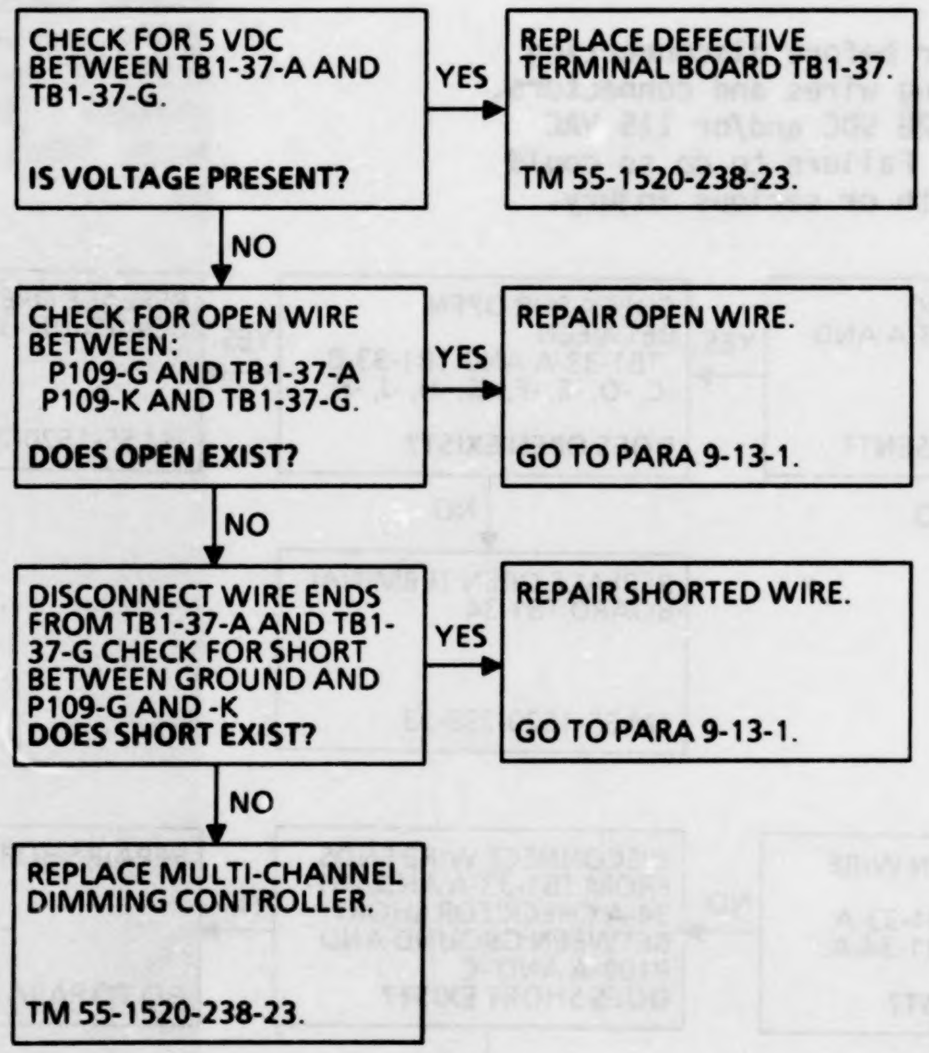
Personnel Required: (para 9-13-10)

References: (para 9-13-10)

Equipment Conditions: (para 9-13-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-37-A AND TB1-37-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-37.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P109-G AND TB1-37-A P109-K AND TB1-37-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-37-A AND TB1-37-G CHECK FOR SHORT BETWEEN GROUND AND P109-G AND -K
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-13-12. ALL CH. 2 NO. 3 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-10)

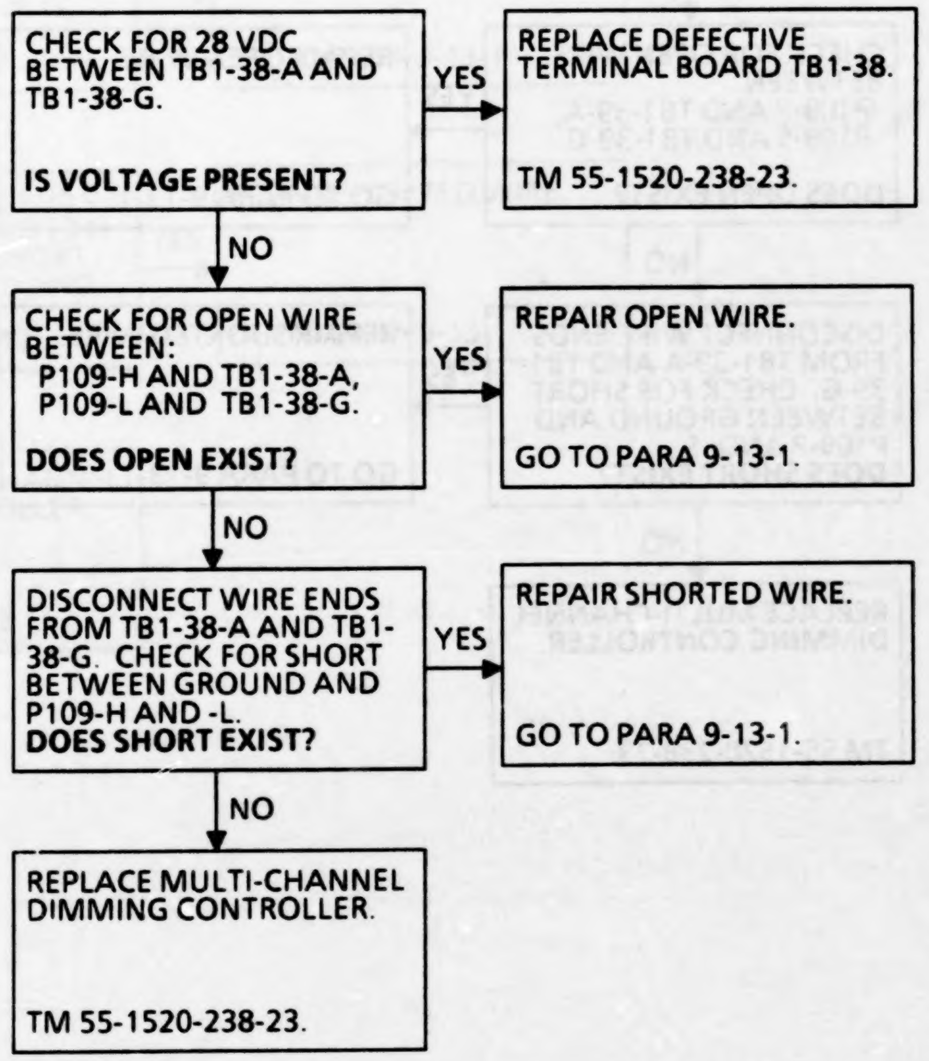
Personnel Required: (para 9-13-10)

References: (para 9-13-10)

Equipment Conditions: (para 9-13-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN TB1-38-A AND TB1-38-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-38.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P109-H AND TB1-38-A,
P109-L AND TB1-38-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-38-A AND TB1-38-G. CHECK FOR SHORT BETWEEN GROUND AND P109-H AND -L.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-13-13. ALL CH. 3 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-10)

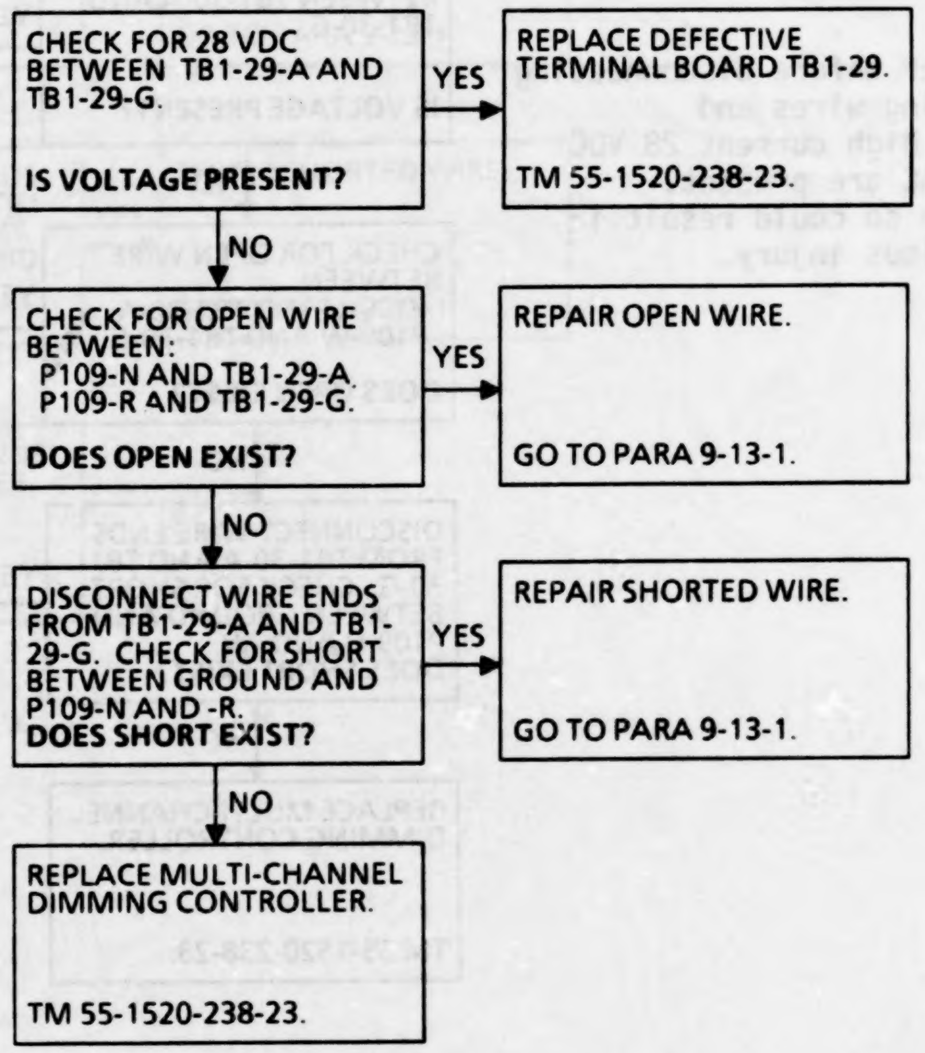
Personnel Required: (para 9-13-10)

References: (para 9-13-10)

Equipment Conditions: (para 9-13-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN TB1-29-A AND TB1-29-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-29.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P109-N AND TB1-29-A,
P109-R AND TB1-29-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-29-A AND TB1-29-G. CHECK FOR SHORT BETWEEN GROUND AND P109-N AND -R.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-13-14. ALL CH. 3 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

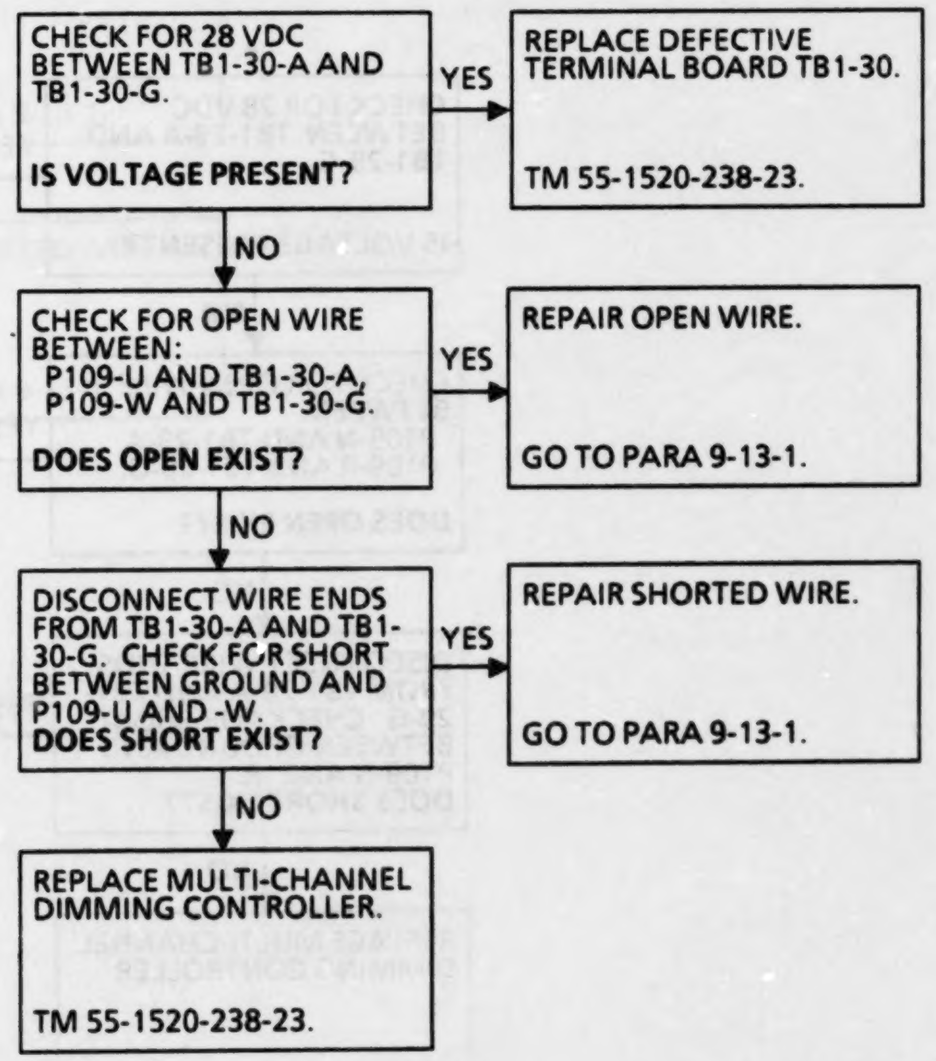
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN TB1-30-A AND TB1-30-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-30.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P109-U AND TB1-30-A,
P109-W AND TB1-30-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-30-A AND TB1-30-G. CHECK FOR SHORT BETWEEN GROUND AND P109-U AND -W.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-13-15. ALL CH. 3 NO. 3 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-14)

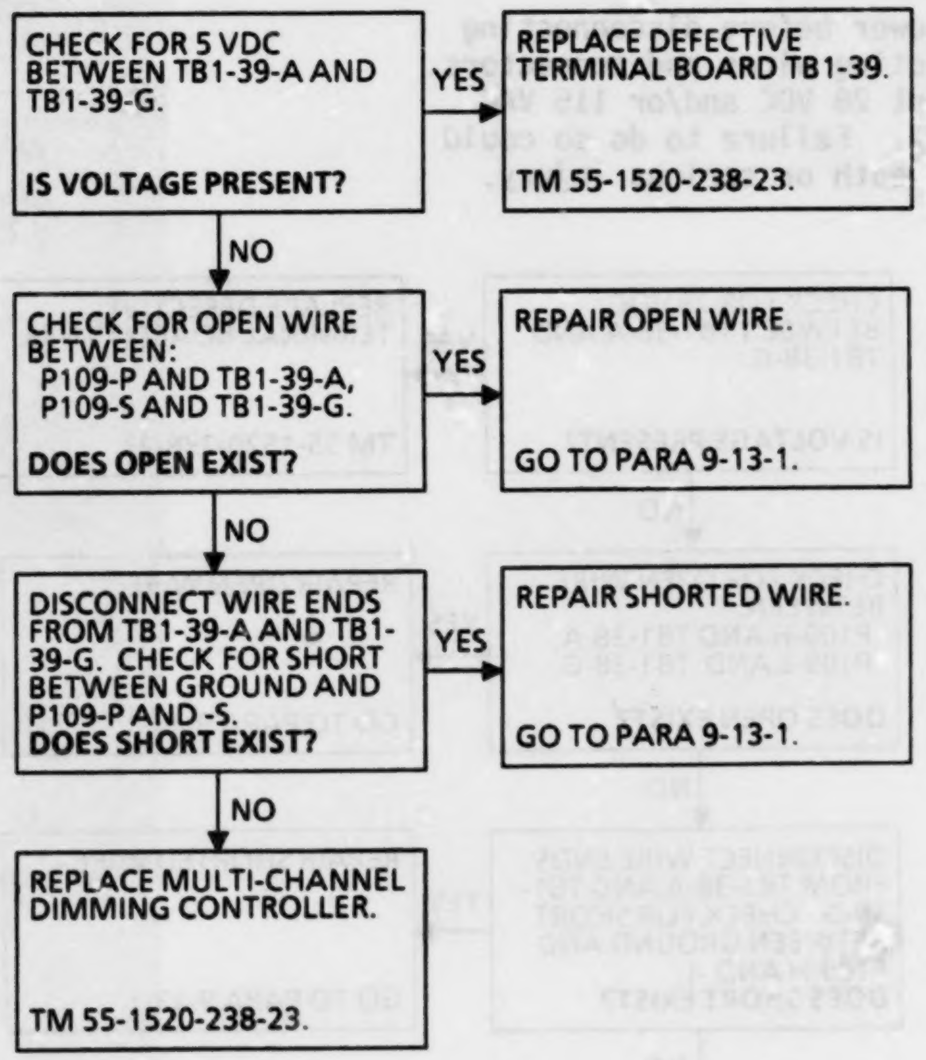
Personnel Required: (para 9-13-14)

References: (para 9-13-14)

Equipment Conditions: (para 9-13-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-39-A AND TB1-39-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-39.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P109-P AND TB1-39-A,
P109-S AND TB1-39-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-39-A AND TB1-39-G. CHECK FOR SHORT BETWEEN GROUND AND P109-P AND -S.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-13-16. ALL CH. 4 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-14)

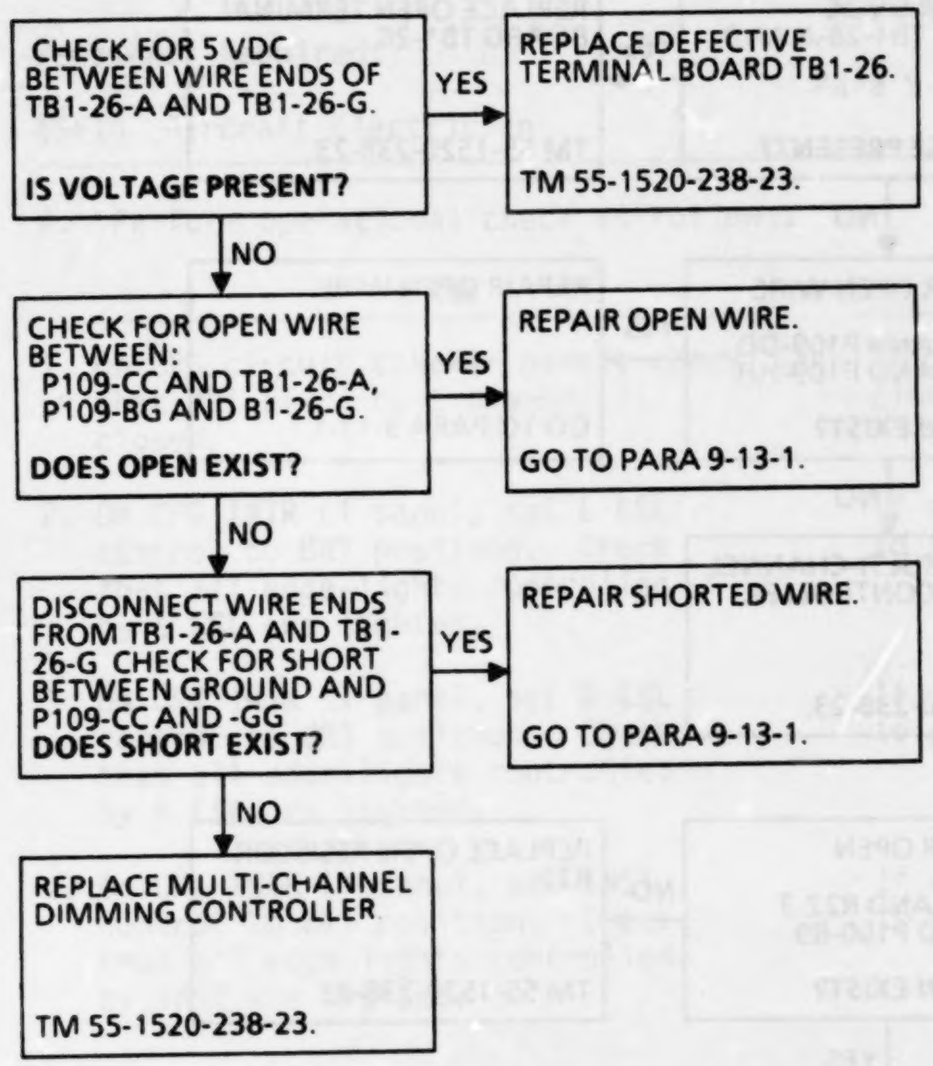
Personnel Required: (para 9-13-14)

References: (para 9-13-14)

Equipment Conditions: (para 9-13-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN WIRE ENDS OF TB1-26-A AND TB1-26-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-26.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P109-CC AND TB1-26-A,
P109-BG AND B1-26-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-26-A AND TB1-26-G CHECK FOR SHORT BETWEEN GROUND AND P109-CC AND -GG
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER
TM 55-1520-238-23.

END OF TASK

9-13-17. ALL CH. 4 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-14)

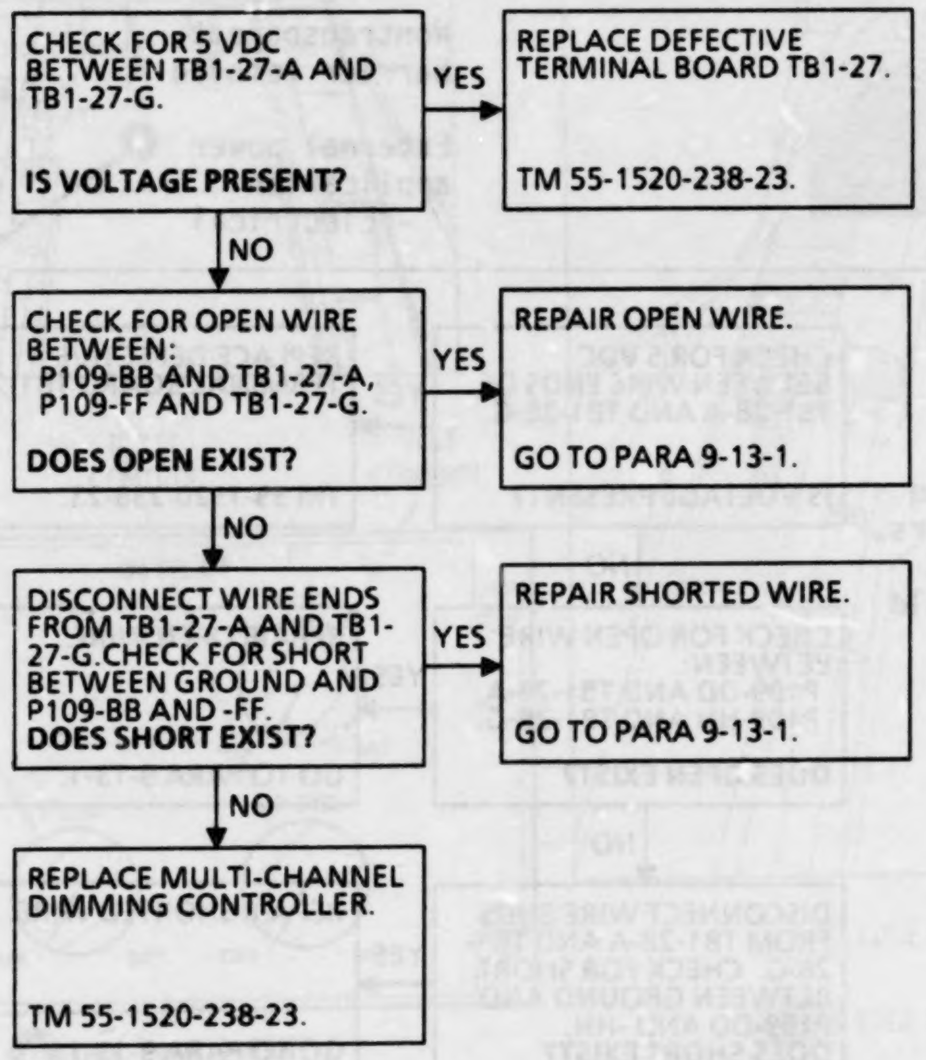
Personnel Required: (para 9-13-14)

References: (para 9-13-14)

Equipment Conditions: (para 9-13-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-27-A AND TB1-27-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-27.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P109-BB AND TB1-27-A,
P109-FF AND TB1-27-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-27-A AND TB1-27-G.CHECK FOR SHORT BETWEEN GROUND AND P109-BB AND -FF.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-13-18. ALL CH. 4 NO. 4 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10	Aircraft Electrician
	One person to assist

References:

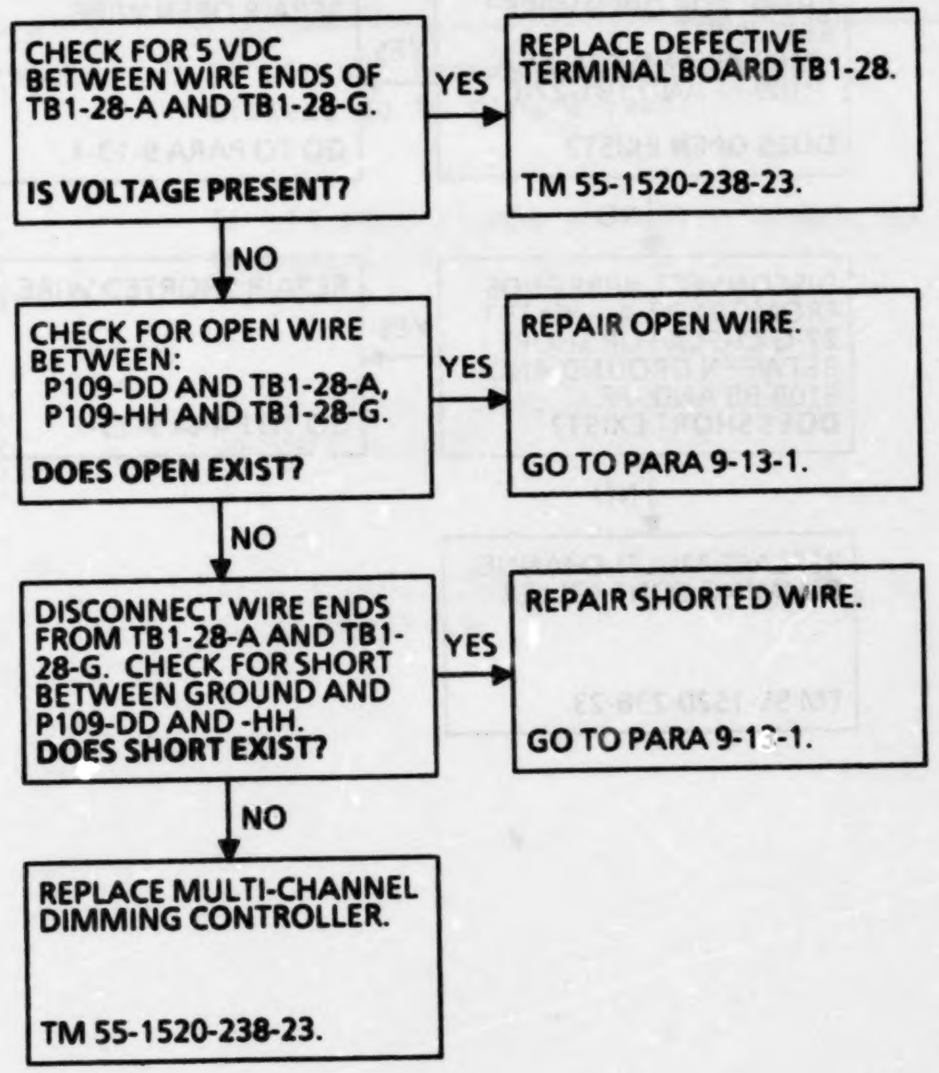
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN WIRE ENDS OF TB1-28-A AND TB1-28-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-28.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P109-DD AND TB1-28-A,
P109-HH AND TB1-28-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-28-A AND TB1-28-G. CHECK FOR SHORT BETWEEN GROUND AND P109-DD AND -HH.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-13-19. EXT LT/INTR LT EDGE-LIGHT - DOES NOT LIGHT

Tools: (para 9-13-18)

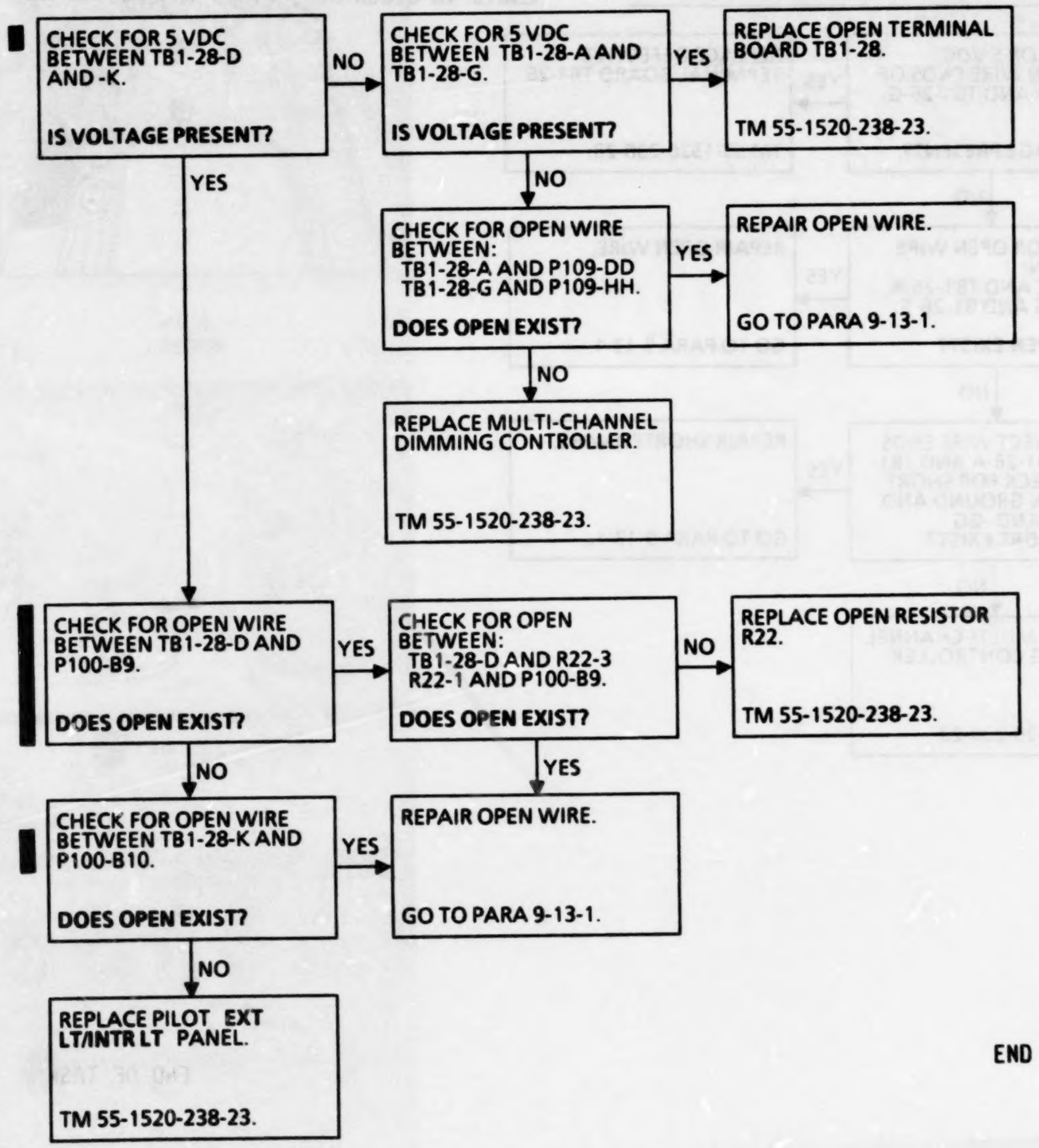
Personnel Required: (para 9-13-18)

References: (para 9-13-18)

Equipment Conditions: (para 9-13-18)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-28-D AND -K.
IS VOLTAGE PRESENT?
NO
CHECK FOR 5 VDC BETWEEN TB1-28-A AND TB1-28-G.
IS VOLTAGE PRESENT?
YES
REPLACE OPEN TERMINAL BOARD TB1-28.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
TB1-28-A AND P109-DD
TB1-28-G AND P109-HH.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.
YES
CHECK FOR OPEN WIRE BETWEEN TB1-28-D AND P100-B9.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN:
TB1-28-D AND R22-3
R22-1 AND P100-B9.
DOES OPEN EXIST?
NO
REPLACE OPEN RESISTOR R22.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
CHECK FOR OPEN WIRE BETWEEN TB1-28-K AND P100-B10.
DOES OPEN EXIST?
YES
NO
REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23.

END OF TASK

9-14-1. CPG EDGE-LIGHT - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

References:

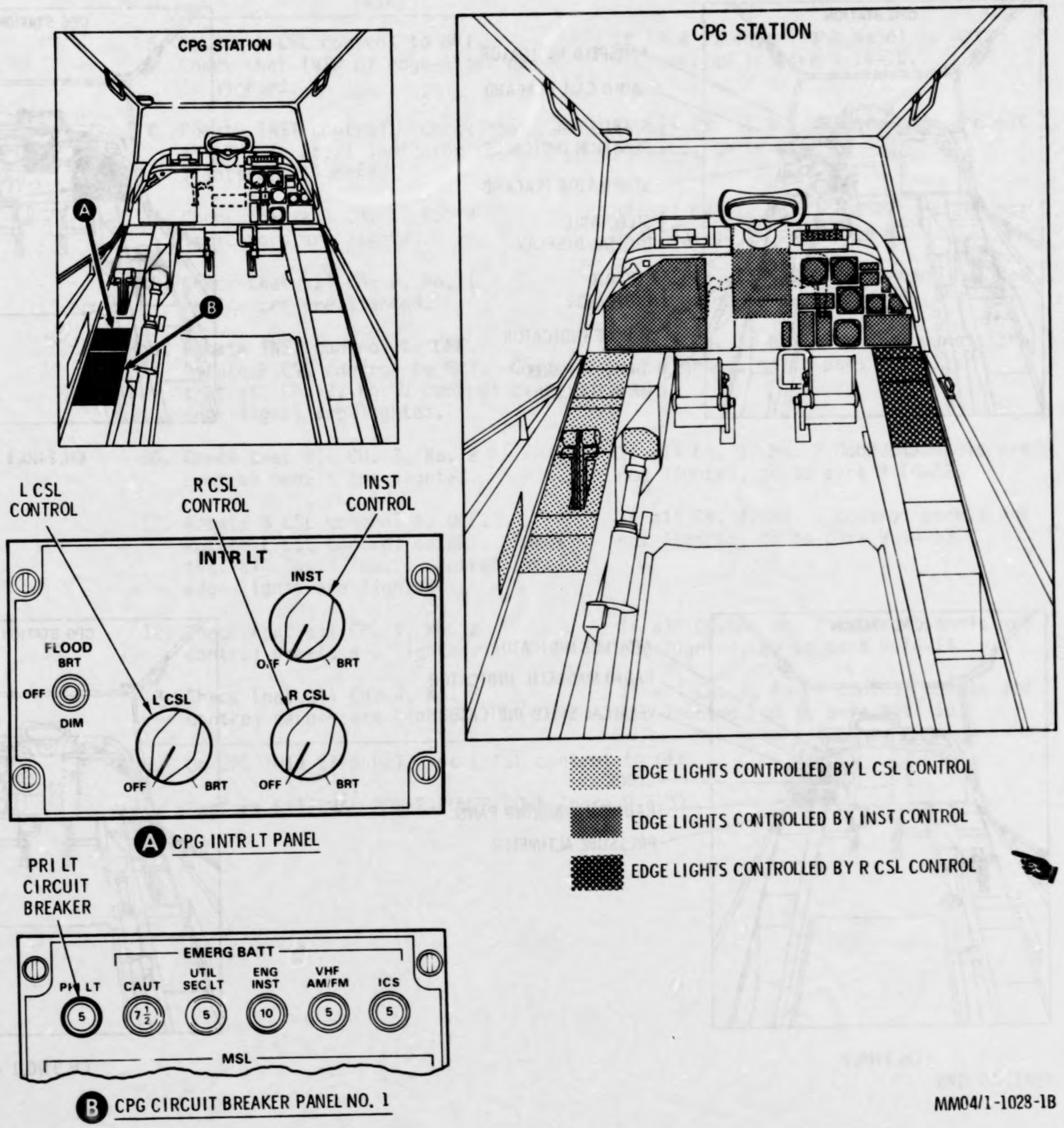
TM 55-1520-238-23

Equipment Conditions:

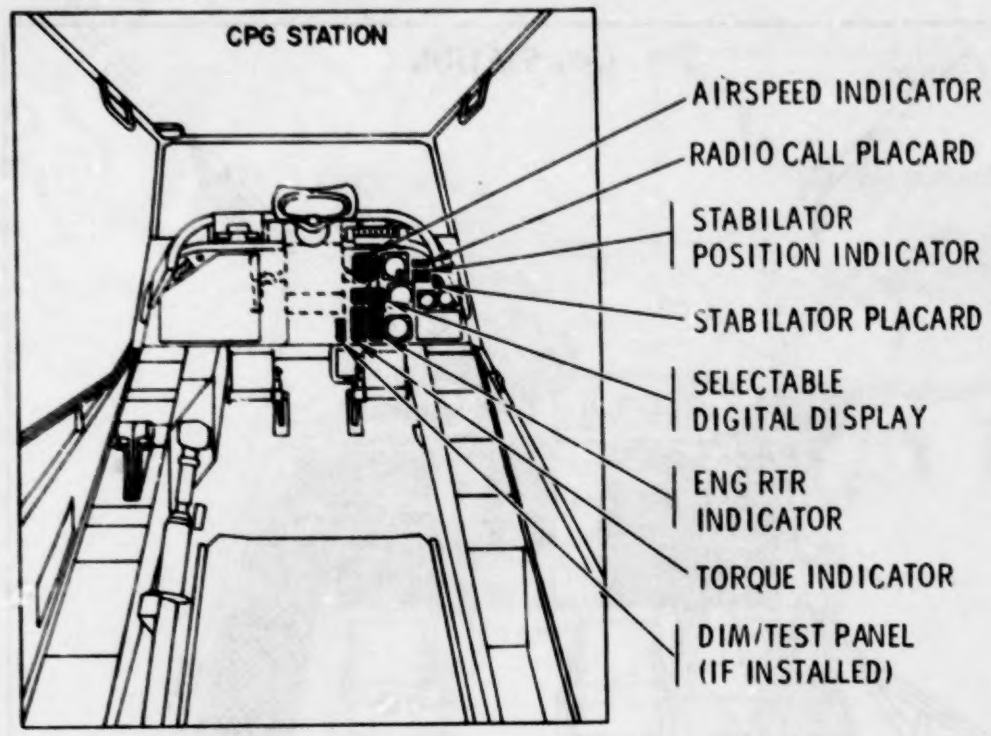
Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

A. Perform operational check as follows:

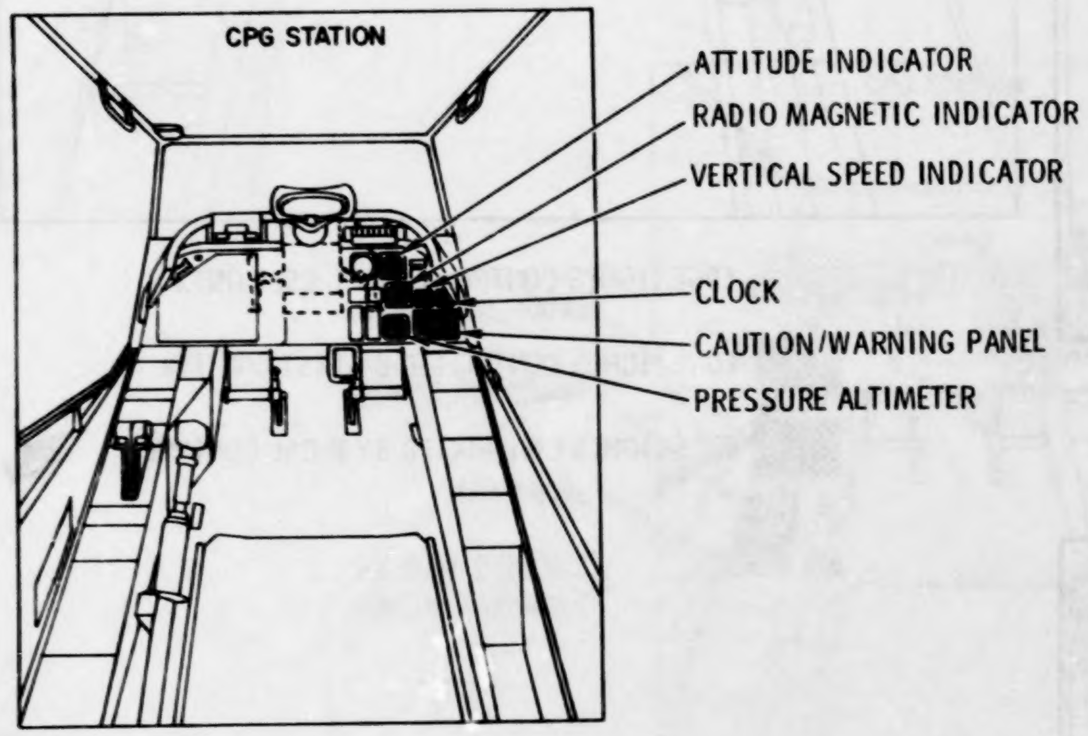
TASK	RESULT
1. On CPG circuit breaker panel, check that **PRI LT** circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-14-4.
2. On CPG **INTR LT** panel, set **L CSL** control to **BRT** position. Check that all edge-lights controlled by **L CSL** are lighted.	If all edge-lights are not lighted, go to para 9-14-5.
3. On CPG **INTR LT** panel, set **R CSL** control to **BRT** position. Check that all edge-lights controlled by **R CSL** are lighted.	If all edge-lights are not lighted, go to para 9-14-6.
4. On CPG **INTR LT** panel, set **INST** control to **BRT** position. Check that all edge-lights controlled by **INST** are lighted.	If all edge-lights are not lighted, go to para 9-14-7.


CPG STATION
A
B
L CSL CONTROL
R CSL CONTROL
INST CONTROL
INTR LT
INST
OFF
BRT
FLOOD
BRT
OFF
DIM
L CSL
R CSL
OFF
BRT
OFF
BRT
A CPG INTR LT PANEL
PRI LT CIRCUIT BREAKER
EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7 1/2
5
10
5
5
MSL
B CPG CIRCUIT BREAKER PANEL NO. 1
CPG STATION
░ EDGE LIGHTS CONTROLLED BY L CSL CONTROL
▒ EDGE LIGHTS CONTROLLED BY INST CONTROL
▓ EDGE LIGHTS CONTROLLED BY R CSL CONTROL
MM04/1-1028-1B

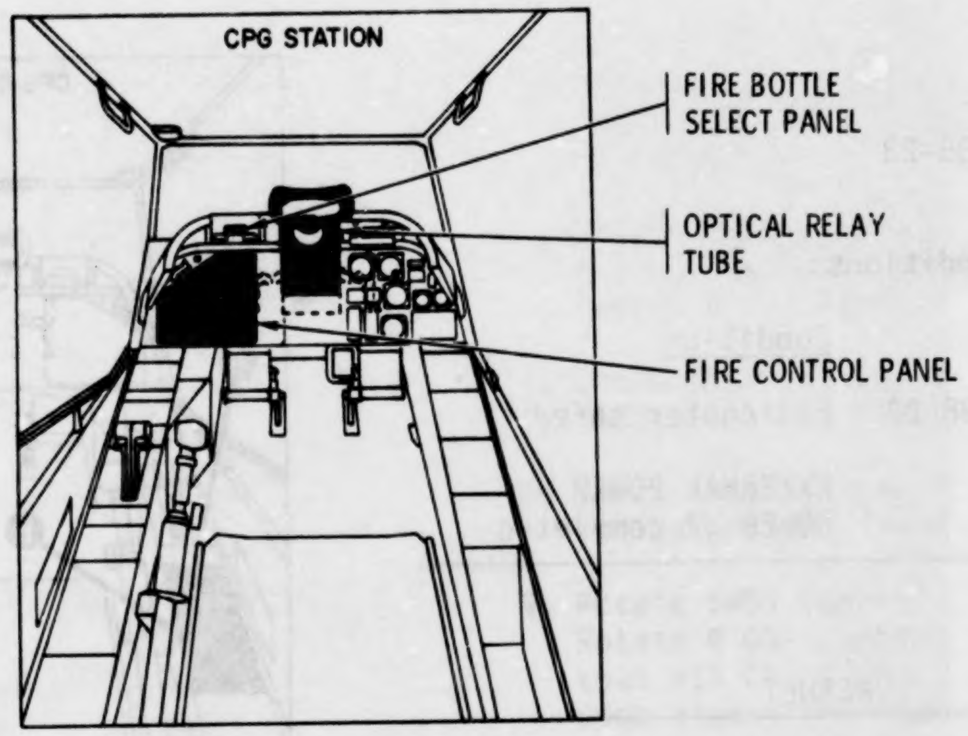
9-14-1. CPG EDGE-LIGHT - OPERATIONAL CHECK (cont)


CPG STATION
AIRSPEED INDICATOR
RADIO CALL PLACARD
STABILATOR POSITION INDICATOR
STABILATOR PLACARD
SELECTABLE DIGITAL DISPLAY
ENG RTR INDICATOR
TORQUE INDICATOR
DIM/TEST PANEL (IF INSTALLED)

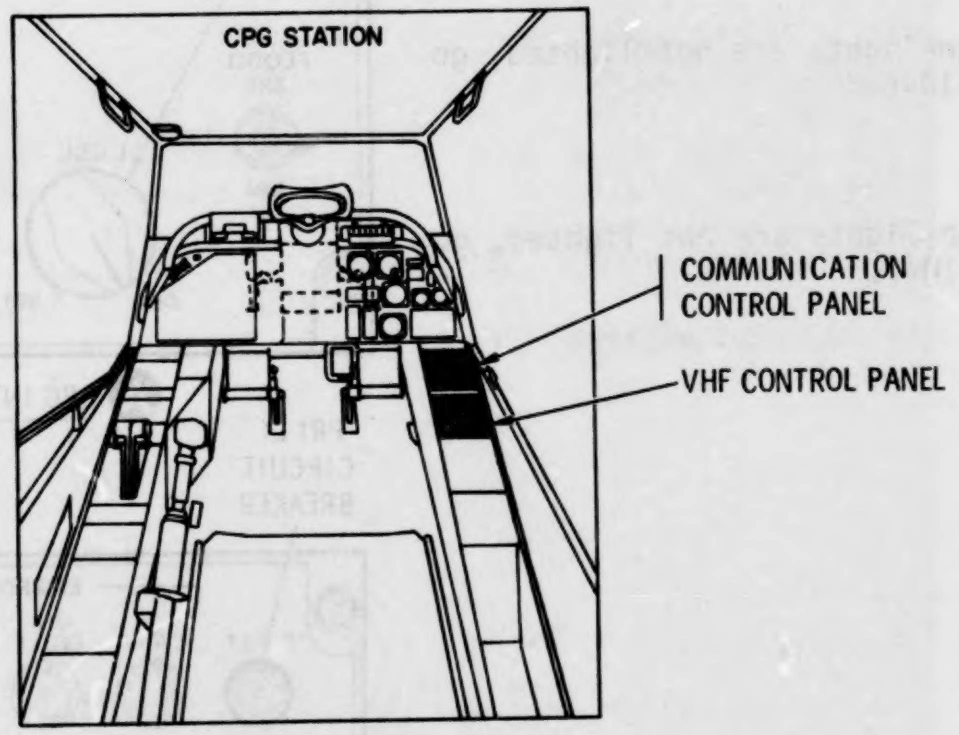
CH. 1 NO. 1


CPG STATION
ATTITUDE INDICATOR
RADIO MAGNETIC INDICATOR
VERTICAL SPEED INDICATOR
CLOCK
CAUTION/WARNING PANEL
PRESSURE ALTIMETER

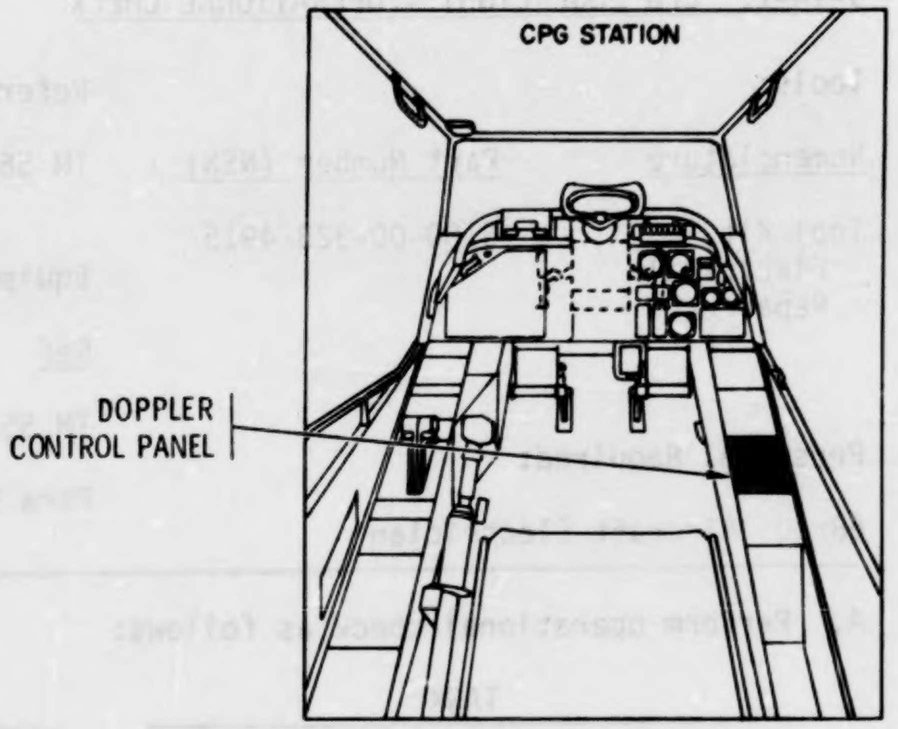
CH. 1 NO. 2


CPG STATION
FIRE BOTTLE SELECT PANEL
OPTICAL RELAY TUBE
FIRE CONTROL PANEL

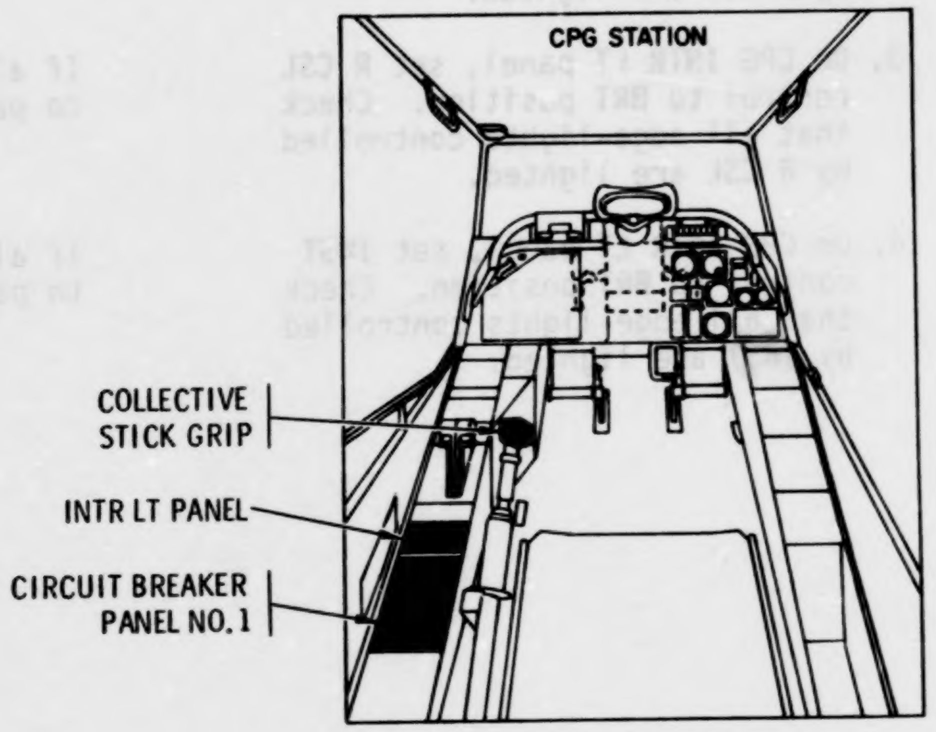
CH. 2 NO. 1


CPG STATION
COMMUNICATION CONTROL PANEL
VHF CONTROL PANEL

CH. 3 NO. 1


CPG STATION
DOPPLER CONTROL PANEL

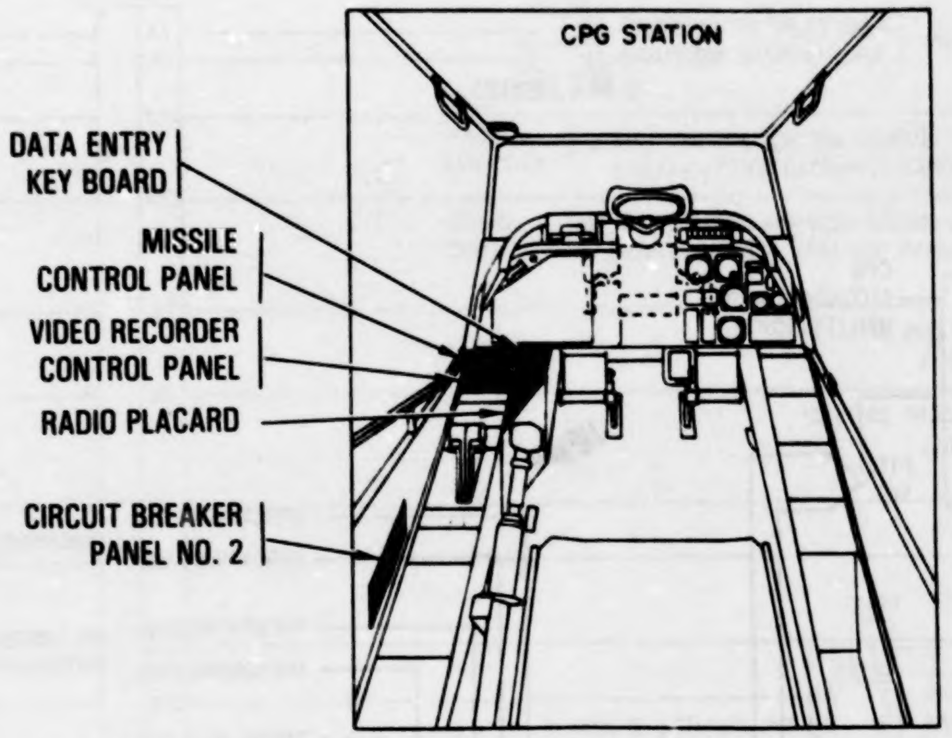
CH. 3 NO. 2


CPG STATION
COLLECTIVE STICK GRIP
INTR LT PANEL
CIRCUIT BREAKER PANEL NO. 1

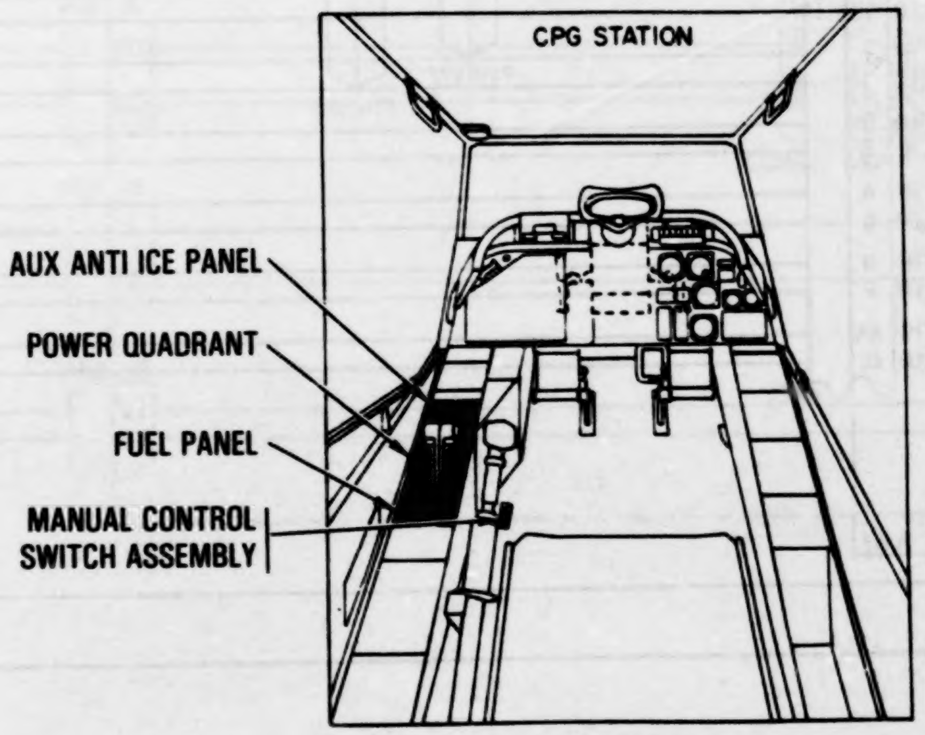
CH. 4 NO. 3 MM04/1-1028-2A

GO TO NEXT PAGE

9-14-1. CPG EDGE-LIGHT - OPERATIONAL CHECK (cont)


CPG STATION
DATA ENTRY KEY BOARD
MISSILE CONTROL PANEL
VIDEO RECORDER CONTROL PANEL
RADIO PLACARD
CIRCUIT BREAKER PANEL NO. 2

CH. 4 NO. 1


CPG STATION
AUX ANTI ICE PANEL
POWER QUADRANT
FUEL PANEL
MANUAL CONTROL SWITCH ASSEMBLY

CH. 4 NO. 2

MM04/1-1028-3

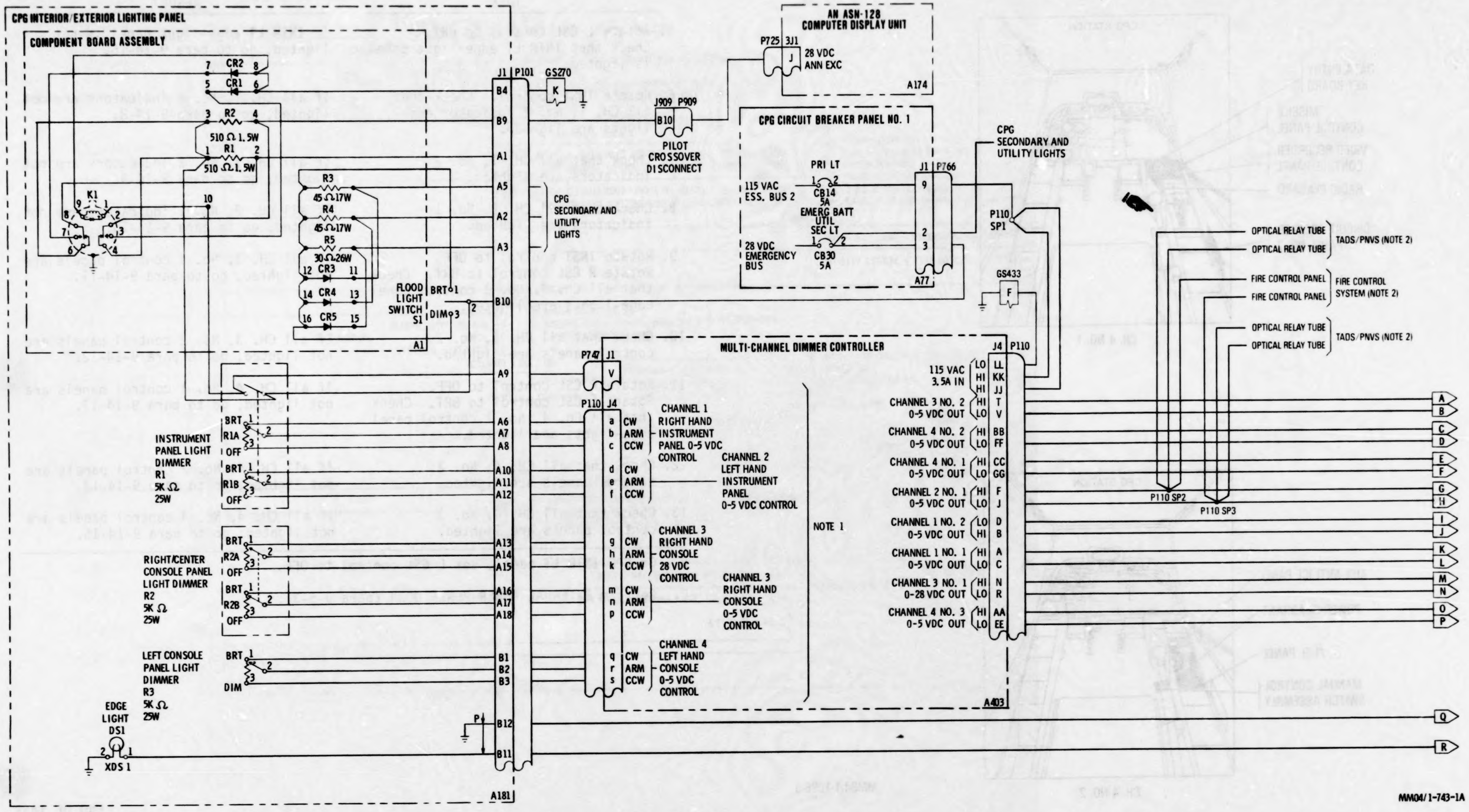
TASK	RESULT
5. Rotate L **CSL** control to **BRT**. Check that **INTR LT** edge-light panel is lighted.	If **INTR LT** edge-light panel is not lighted, go to para 9-14-16.
6. Rotate **INST** control. Check that all CH. 1, No. 1 indicator edge-lights are lighted.	If all CH. 1, No. 1 indicators are not lighted, go to para 9-14-8.
7. Check that all CH. 1, No. 2 indicators are lighted.	If all CH. 1, No. 2 indicators are not lighted, go to para 9-14-9.
8. Check that all CH. 2, No. 1 indicators are lighted.	If all CH. 2, No. 1 indicators are not lighted, go to para 9-14-10.
9. Rotate **INST** control to **OFF**. Rotate **R CSL** control to **BRT**. Check that all Ch. 3, No. 1 control panel edge-lights are lighted.	If all CH. 3, No. 1 control panels are not lighted, go to para 9-14-11.
10. Check that all CH. 3, No. 2 control panels are lighted.	If all CH. 3, No. 2 control panels are not lighted, go to para 9-14-12.
11. Rotate **R CSL** control to **OFF**. Rotate **L CSL** control to **BRT**. Check that all Ch. 4, No. 1 control panel edge-lights are lighted.	If all CH. 4, No. 1 control panels are not lighted, go to para 9-14-13.
12. Check that all CH. 4, No. 2 control panels are lighted.	If all CH. 4, No. 2 control panels are not lighted, go to para 9-14-14.
13. Check that all CH. 4, No. 3 control panels are lighted.	If all CH. 4, No. 4 control panels are not lighted, go to para 9-14-15.

B. On CPG **INTR LT** panel, set **L CSL** control to **OFF**.

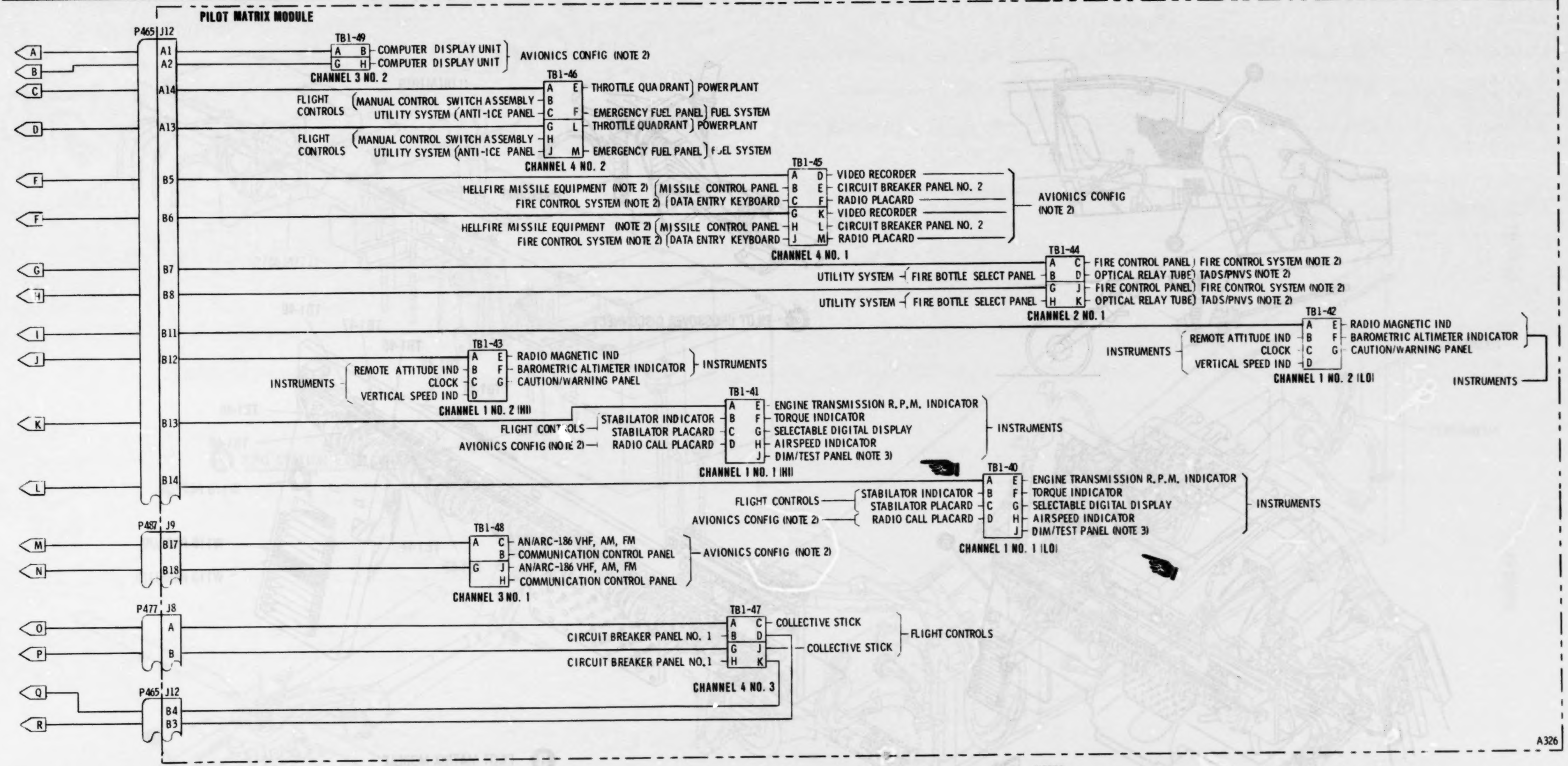
C. Perform EXTERNAL POWER-POWER DOWN (para 9-5-3).

END OF TASK

9-14-2. CPG EDGE-LIGHT - INTERCONNECTION DIAGRAM


CPG INTERIOR/EXTERIOR LIGHTING PANEL
COMPONENT BOARD ASSEMBLY
CR2
CR1
R2
510 Ω 1.5W
R1
510 Ω 1.5W
K1
R3
45 Ω 17W
R4
45 Ω 17W
R5
30 Ω 26W
CR3
CR4
CR5
FLOOD LIGHT SWITCH S1
BRT
DIM
A1
J1 P101
GS270
K
CPG SECONDARY AND UTILITY LIGHTS
INSTRUMENT PANEL LIGHT DIMMER R1 5K Ω 25W
BRT
R1A
OFF
R1B
RIGHT/CENTER CONSOLE PANEL LIGHT DIMMER R2 5K Ω 25W
R2A
R2B
LEFT CONSOLE PANEL LIGHT DIMMER R3 5K Ω 25W
EDGE LIGHT DS1
XDS 1
A181
J909 P909
B10
PILOT CROSSOVER DISCONNECT
AN ASN-128 COMPUTER DISPLAY UNIT
P725 3J1
28 VDC ANN EXC
A174
CPG CIRCUIT BREAKER PANEL NO. 1
PRI LT
CB14 5A
115 VAC ESS. BUS 2
EMERG BATT UTIL SEC LT
28 VDC EMERGENCY BUS
CB30 5A
J1 P766
A77
CPG SECONDARY AND UTILITY LIGHTS
P110 SP1
GS433
F
OPTICAL RELAY TUBE
OPTICAL RELAY TUBE
TADS/PNVS (NOTE 2)
FIRE CONTROL PANEL
FIRE CONTROL PANEL
FIRE CONTROL SYSTEM (NOTE 2)
OPTICAL RELAY TUBE
OPTICAL RELAY TUBE
TADS/PNVS (NOTE 2)
MULTI-CHANNEL DIMMER CONTROLLER
P747 J1
V
P110 J4
CW ARM CCW
CHANNEL 1 RIGHT HAND INSTRUMENT PANEL 0-5 VDC CONTROL
CHANNEL 2 LEFT HAND INSTRUMENT PANEL 0-5 VDC CONTROL
CHANNEL 3 RIGHT HAND CONSOLE 28 VDC CONTROL
CHANNEL 3 RIGHT HAND CONSOLE 0-5 VDC CONTROL
CHANNEL 4 LEFT HAND CONSOLE 0-5 VDC CONTROL
NOTE 1
J4 P110
115 VAC 3.5A IN
CHANNEL 3 NO. 2 0-5 VDC OUT
CHANNEL 4 NO. 2 0-5 VDC OUT
CHANNEL 4 NO. 1 0-5 VDC OUT
CHANNEL 2 NO. 1 0-5 VDC OUT
CHANNEL 1 NO. 2 0-5 VDC OUT
CHANNEL 1 NO. 1 0-5 VDC OUT
CHANNEL 3 NO. 1 0-28 VDC OUT
CHANNEL 4 NO. 3 0-5 VDC OUT
A403
P110 SP2
P110 SP3
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
MM04/1-743-1A

9-14-2. CPG EDGE-LIGHT - INTERCONNECTION DIAGRAM (cont)

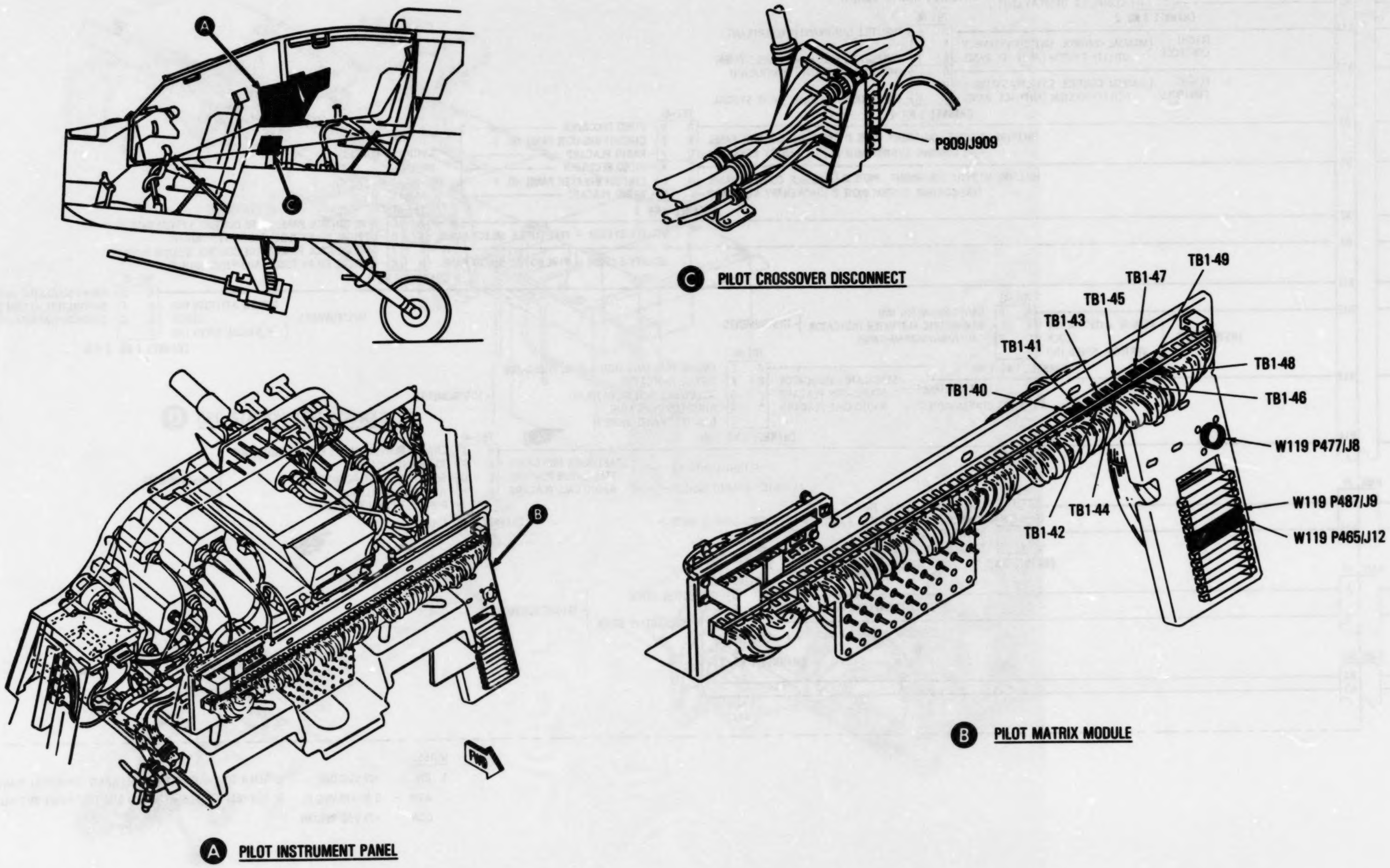

PILOT MATRIX MODULE
P465 J12
A
B
C
D
F
F
G
H
I
J
K
L
A1
A2
A14
A13
B5
B6
B7
B8
B11
B12
B13
B14
TB1-49
A B COMPUTER DISPLAY UNIT
G H COMPUTER DISPLAY UNIT
AVIONICS CONFIG (NOTE 2)
CHANNEL 3 NO. 2
TB1-46
E THROTTLE QUADRANT POWERPLANT
FLIGHT CONTROLS (MANUAL CONTROL SWITCH ASSEMBLY B
UTILITY SYSTEM (ANTI-ICE PANEL C
F EMERGENCY FUEL PANEL FUEL SYSTEM
L THROTTLE QUADRANT POWERPLANT
FLIGHT CONTROLS (MANUAL CONTROL SWITCH ASSEMBLY H
UTILITY SYSTEM (ANTI-ICE PANEL J
M EMERGENCY FUEL PANEL FUEL SYSTEM
CHANNEL 4 NO. 2
TB1-45
D VIDEO RECORDER
HELLFIRE MISSILE EQUIPMENT (NOTE 2) (MISSILE CONTROL PANEL B
E CIRCUIT BREAKER PANEL NO. 2
FIRE CONTROL SYSTEM (NOTE 2) (DATA ENTRY KEYBOARD C
F RADIO PLACARD
K VIDEO RECORDER
HELLFIRE MISSILE EQUIPMENT (NOTE 2) (MISSILE CONTROL PANEL H
L CIRCUIT BREAKER PANEL NO. 2
FIRE CONTROL SYSTEM (NOTE 2) (DATA ENTRY KEYBOARD J
M RADIO PLACARD
AVIONICS CONFIG (NOTE 2)
CHANNEL 4 NO. 1
TB1-44
C FIRE CONTROL PANEL FIRE CONTROL SYSTEM (NOTE 2)
UTILITY SYSTEM FIRE BOTTLE SELECT PANEL B
D OPTICAL RELAY TUBE TADS/PNVS (NOTE 2)
J FIRE CONTROL PANEL FIRE CONTROL SYSTEM (NOTE 2)
UTILITY SYSTEM FIRE BOTTLE SELECT PANEL H
K OPTICAL RELAY TUBE TADS/PNVS (NOTE 2)
CHANNEL 2 NO. 1
TB1-42
E RADIO MAGNETIC IND
INSTRUMENTS REMOTE ATTITUDE IND B
F BAROMETRIC ALTIMETER INDICATOR
CLOCK C
G CAUTION/WARNING PANEL
VERTICAL SPEED IND D
INSTRUMENTS
CHANNEL 1 NO. 2 (LO)
TB1-43
E RADIO MAGNETIC IND
INSTRUMENTS REMOTE ATTITUDE IND B
F BAROMETRIC ALTIMETER INDICATOR
CLOCK C
G CAUTION/WARNING PANEL
VERTICAL SPEED IND D
INSTRUMENTS
CHANNEL 1 NO. 2 (HI)
TB1-41
E ENGINE TRANSMISSION R.P.M. INDICATOR
FLIGHT CONTROLS STABILATOR INDICATOR B
F TORQUE INDICATOR
STABILATOR PLACARD C
G SELECTABLE DIGITAL DISPLAY
AVIONICS CONFIG (NOTE 2) RADIO CALL PLACARD D
H AIRSPEED INDICATOR
J DIM/TEST PANEL (NOTE 3)
INSTRUMENTS
CHANNEL 1 NO. 1 (HI)
TB1-40
E ENGINE TRANSMISSION R.P.M. INDICATOR
FLIGHT CONTROLS STABILATOR INDICATOR B
F TORQUE INDICATOR
STABILATOR PLACARD C
G SELECTABLE DIGITAL DISPLAY
AVIONICS CONFIG (NOTE 2) RADIO CALL PLACARD D
H AIRSPEED INDICATOR
J DIM/TEST PANEL (NOTE 3)
INSTRUMENTS
CHANNEL 1 NO. 1 (LO)
P487 J9
M
N
B17
B18
TB1-48
C AN/ARC-186 VHF, AM, FM
B COMMUNICATION CONTROL PANEL
J AN/ARC-186 VHF, AM, FM
H COMMUNICATION CONTROL PANEL
AVIONICS CONFIG (NOTE 2)
CHANNEL 3 NO. 1
P477 J8
O
P
A
B
TB1-47
C COLLECTIVE STICK
CIRCUIT BREAKER PANEL NO. 1 B
D
J
COLLECTIVE STICK
CIRCUIT BREAKER PANEL NO. 1 H
K
FLIGHT CONTROLS
CHANNEL 4 NO. 3
P465 J12
Q
R
B4
B3
A326

NOTES:

1. CW - +28 VDC OUT
   ARM - 0 TO +28 VDC IN
   CCW - +28 VDC RETURN
2. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.
3. FOR HELICOPTERS WITH CPG DIM/TEST PANEL INSTALLED.

MM04/1-743-2B

9-14-3. CPG EDGE-LIGHT PANEL- ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

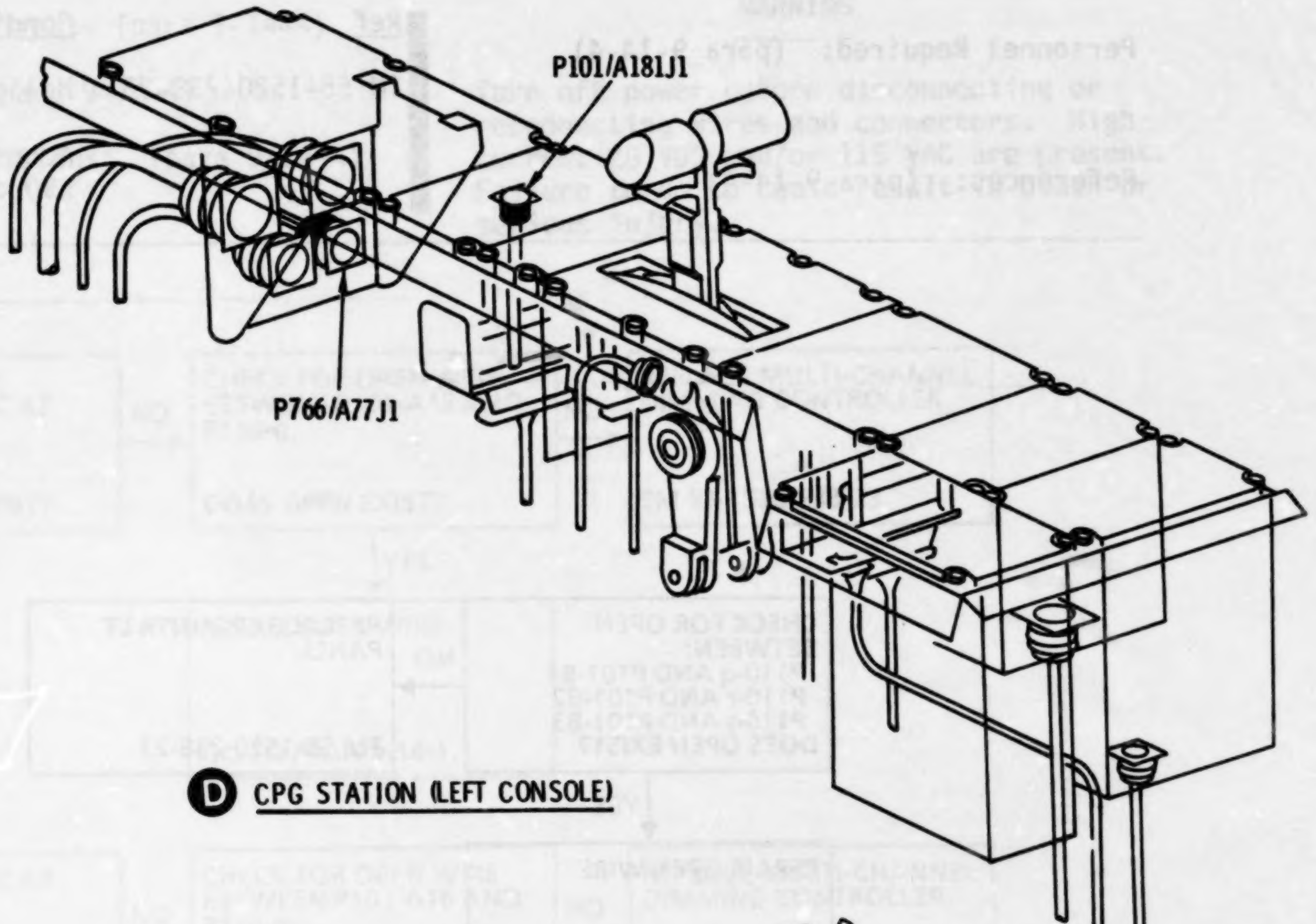

A
C
B
P909/J909
TB1-49
TB1-47
TB1-45
TB1-43
TB1-41
TB1-40
TB1-48
TB1-46
W119 P477/J8
W119 P487/J9
W119 P465/J12
TB1-44
TB1-42
FWD
MM04

Ⓒ PILOT CROSSOVER DISCONNECT

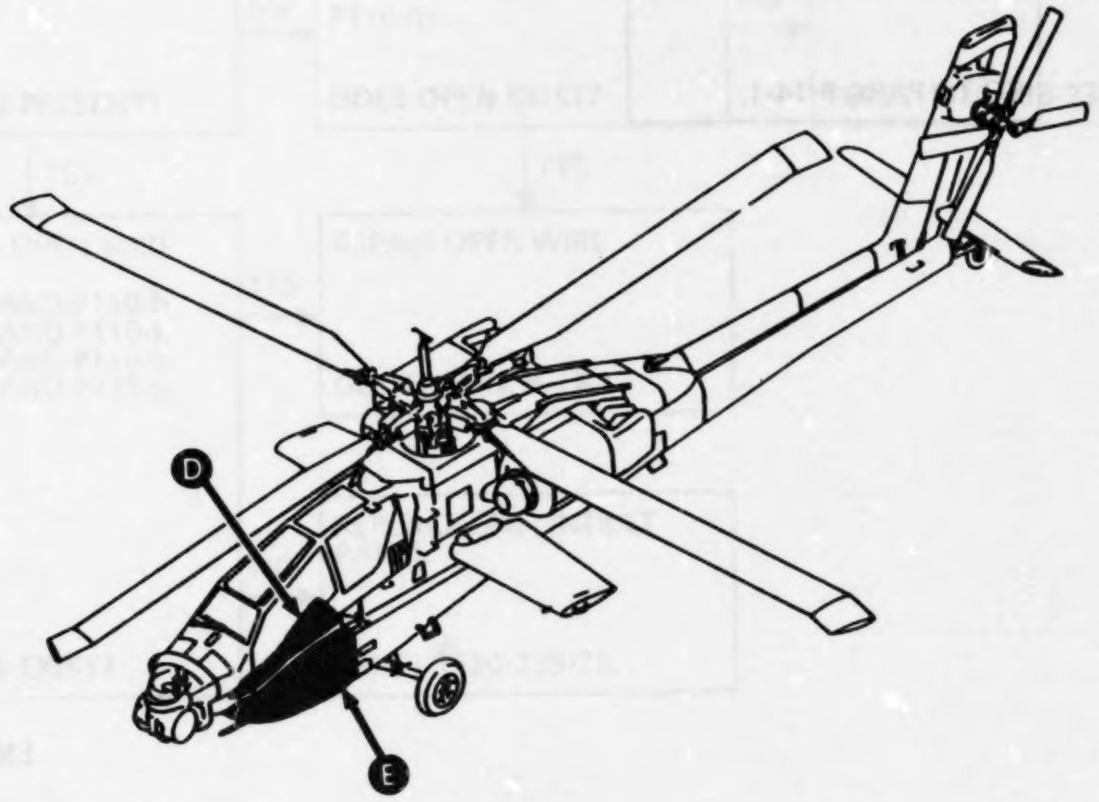
Ⓑ PILOT MATRIX MODULE

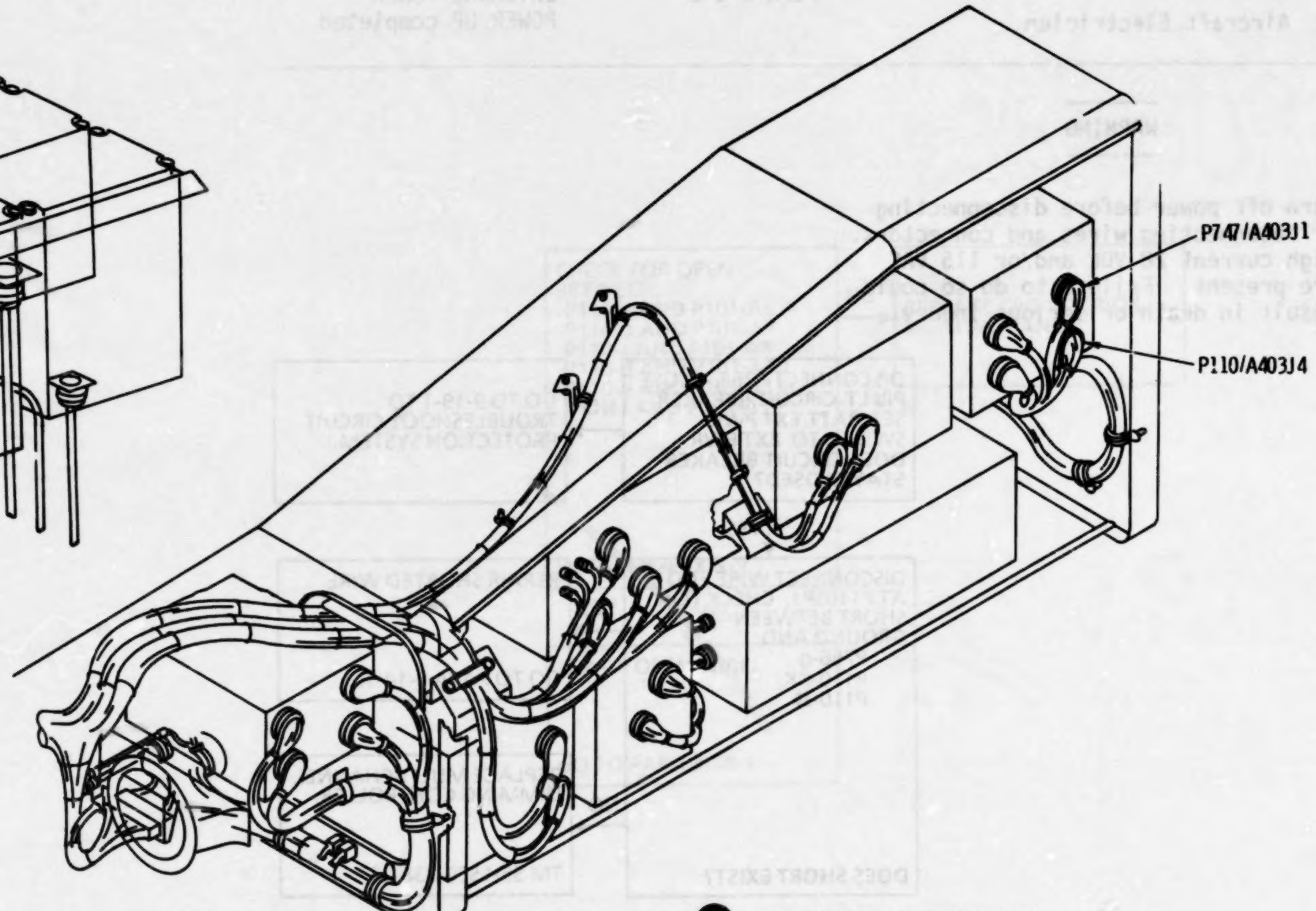
Ⓐ PILOT INSTRUMENT PANEL

9-14-3. CPG EDGE-LIGHT PANEL- ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


P101/A181J1
P766/A77J1

D CPG STATION (LEFT CONSOLE)




P747/A403J1
P110/A403J4

E LEFT FORWARD AVIONICS BAY

MM04/1-1288-2A

9-14-4. CPU PRI LT CIRCUIT BREAKER (CB14) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

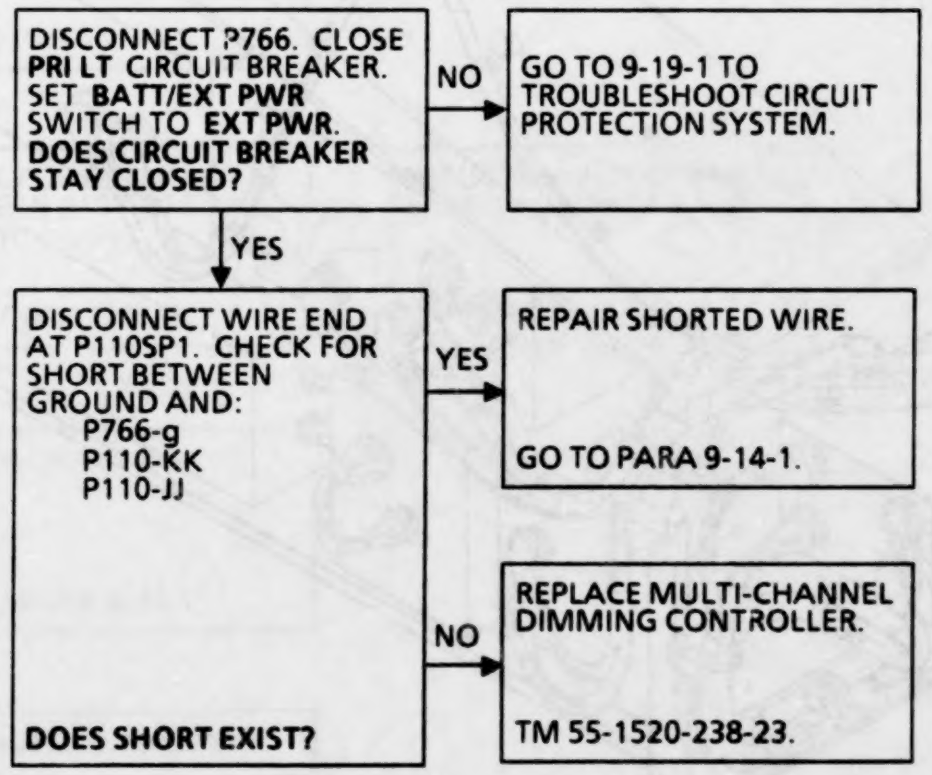
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P766. CLOSE PRI LT CIRCUIT BREAKER. SET BATT/EXT PWR SWITCH TO EXT PWR. DOES CIRCUIT BREAKER STAY CLOSED?
NO
GO TO 9-19-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
DISCONNECT WIRE END AT P110SP1. CHECK FOR SHORT BETWEEN GROUND AND: P766-g P110-KK P110-JJ DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23.

END OF TASK

9-14-5. ALL CPG LEFT CONSOLE EDGE-LIGHTED PANELS - DOES NOT LIGHT

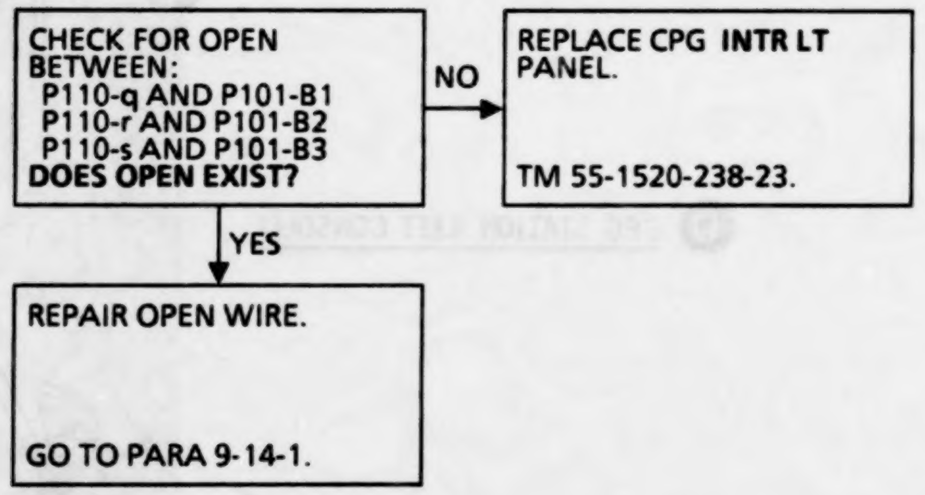
Tools: (para 9-14-4)

Personnel Required: (para 9-14-4)

References: (para 9-14-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened


CHECK FOR OPEN BETWEEN: P110-q AND P101-B1 P110-r AND P101-B2 P110-s AND P101-B3 DOES OPEN EXIST?
NO
REPLACE CPG INTR LT PANEL. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-14-1.

END OF TASK

9-14-6. ALL CPG RIGHT CONSOLE EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools: (para 9-14-4)

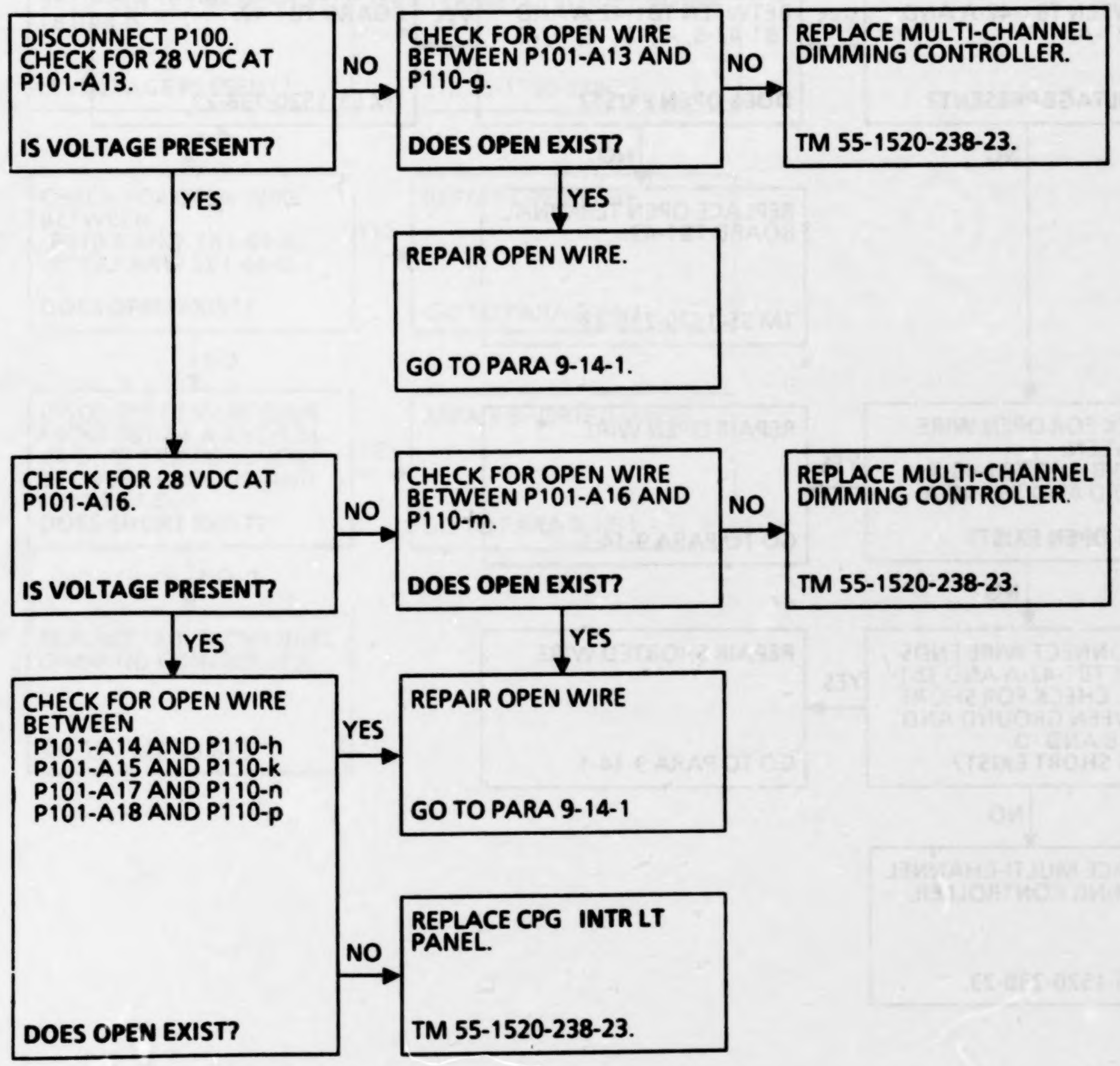
Personnel Required: (para 9-14-4)

References: (para 9-14-4)

Equipment Conditions: (para 9-14-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P100. CHECK FOR 28 VDC AT P101-A13.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN P101-A13 AND P110-g.
DOES OPEN EXIST?
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
YES
CHECK FOR 28 VDC AT P101-A16.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN P101-A16 AND P110-m.
DOES OPEN EXIST?
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE
GO TO PARA 9-14-1
YES
CHECK FOR OPEN WIRE BETWEEN
P101-A14 AND P110-h
P101-A15 AND P110-k
P101-A17 AND P110-n
P101-A18 AND P110-p
DOES OPEN EXIST?
YES
NO
REPLACE CPG INTR LT PANEL.
TM 55-1520-238-23.

END OF TASK

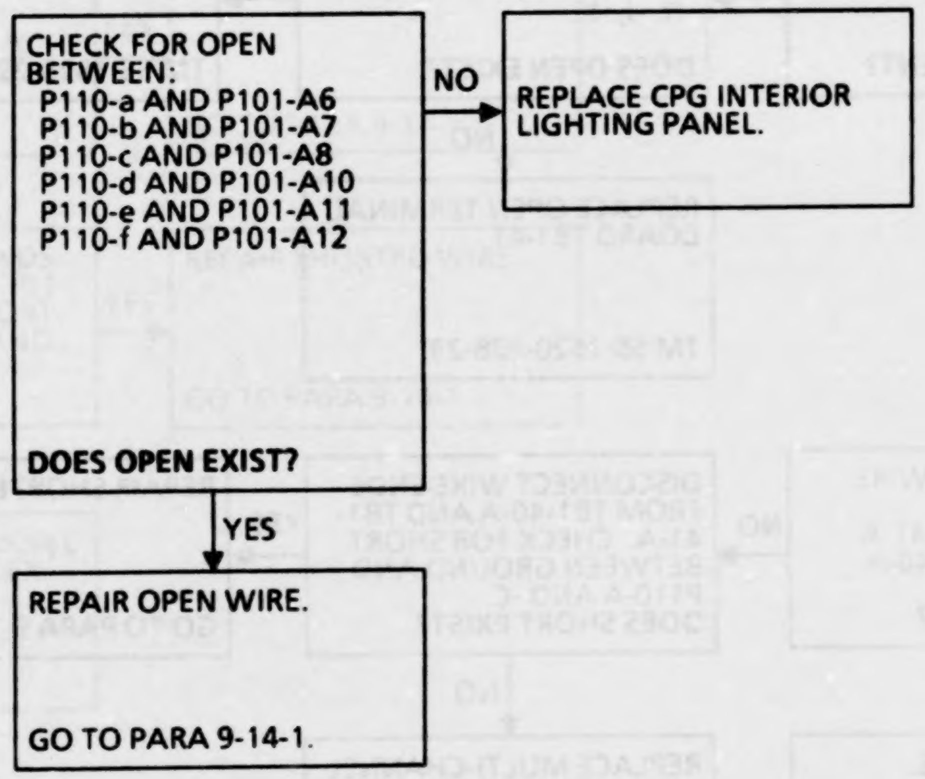
9-14-7. ALL CPG INSTRUMENT EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools: (para 9-14-4)

Personnel Required: (para 9-14-4)

References: (para 9-14-4)

Equipment Conditions: (para 9-14-5)


CHECK FOR OPEN BETWEEN:
P110-a AND P101-A6
P110-b AND P101-A7
P110-c AND P101-A8
P110-d AND P101-A10
P110-e AND P101-A11
P110-f AND P101-A12
DOES OPEN EXIST?
NO
REPLACE CPG INTERIOR LIGHTING PANEL.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.

END OF TASK

9-14-8. ALL CH. 1 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

References:

TM 55-1520-238-23

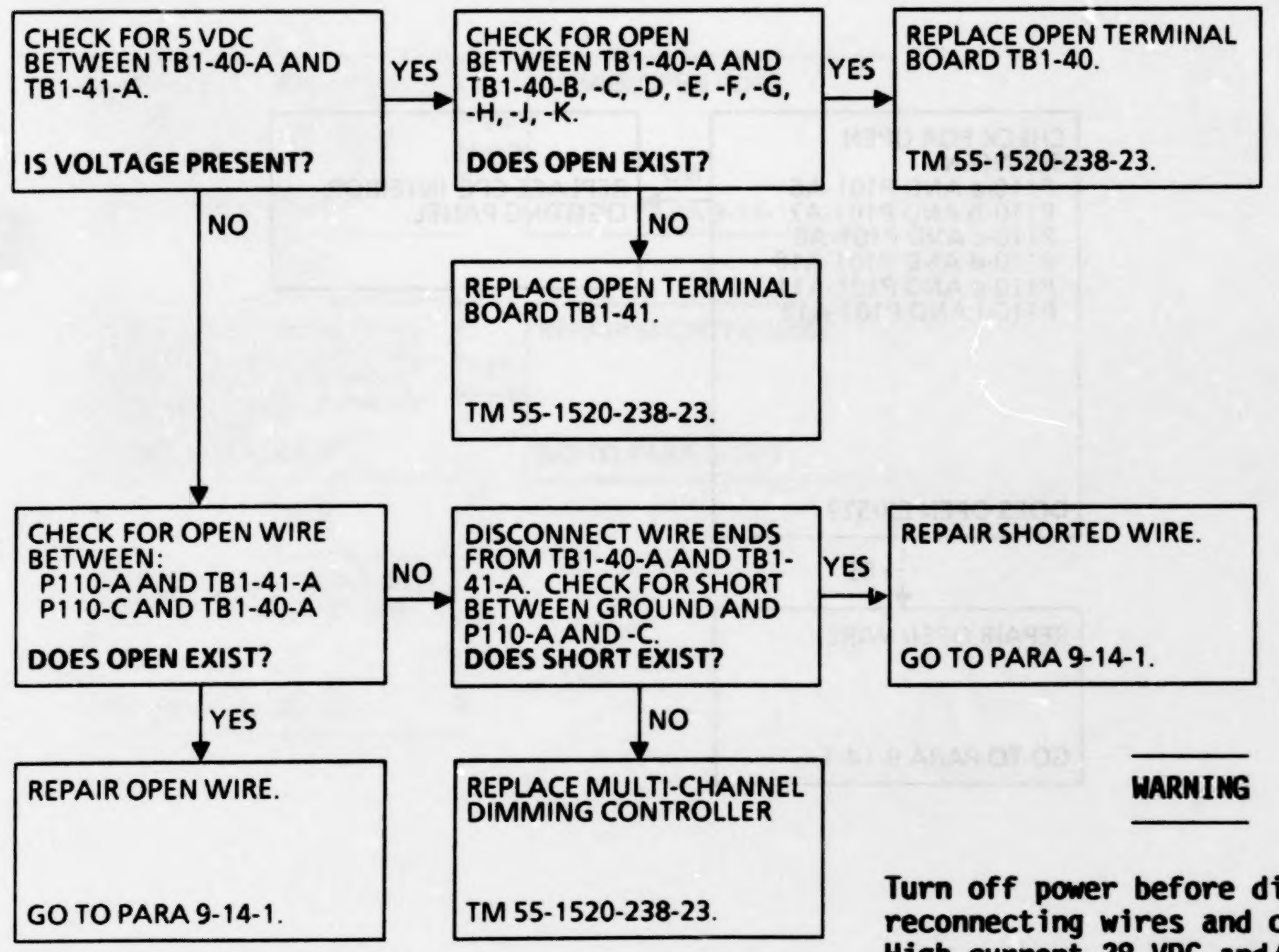
Personnel Required:

68F10 Aircraft Electrician
One person to assist

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
	Nontransparent Barrier removed

REFER TO VOLTAGE WARNING


CHECK FOR 5 VDC BETWEEN TB1-40-A AND TB1-41-A.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-40-A AND TB1-40-B, -C, -D, -E, -F, -G, -H, -J, -K.
DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB1-40.
TM 55-1520-238-23.
NO
REPLACE OPEN TERMINAL BOARD TB1-41.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-A AND TB1-41-A
P110-C AND TB1-40-A
DOES OPEN EXIST?
NO
DISCONNECT WIRE ENDS FROM TB1-40-A AND TB1-41-A. CHECK FOR SHORT BETWEEN GROUND AND P110-A AND -C.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER
TM 55-1520-238-23.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-14-9. ALL CH. 1 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-8)

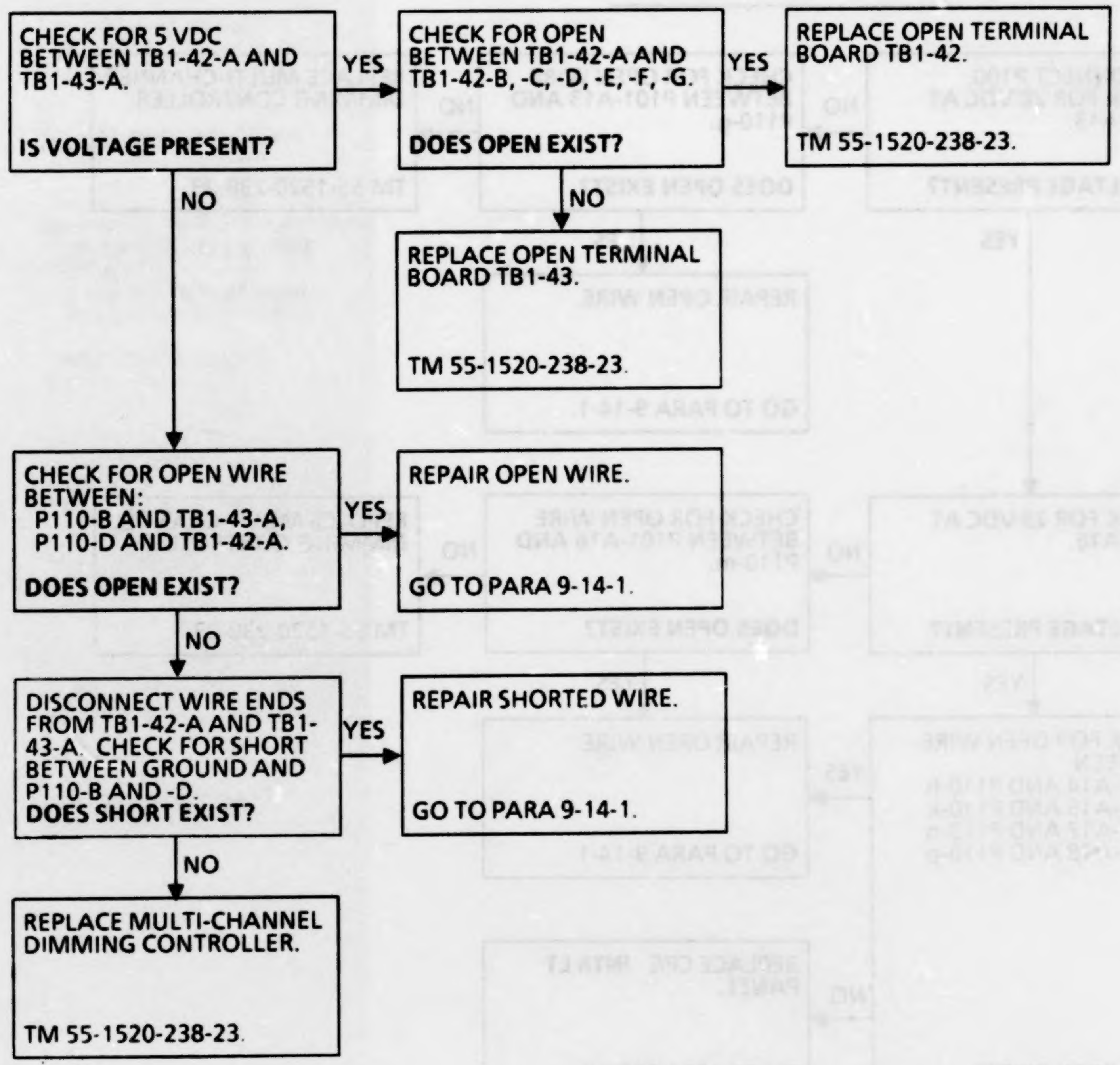
Personnel Required: (para 9-14-8)

References: (para 9-14-8)

Equipment Conditions: (para 9-14-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-42-A AND TB1-43-A.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-42-A AND TB1-42-B, -C, -D, -E, -F, -G.
DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB1-42.
TM 55-1520-238-23.
NO
REPLACE OPEN TERMINAL BOARD TB1-43.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-B AND TB1-43-A,
P110-D AND TB1-42-A.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
DISCONNECT WIRE ENDS FROM TB1-42-A AND TB1-43-A. CHECK FOR SHORT BETWEEN GROUND AND P110-B AND -D.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-14-10. ALL CH. 2 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-8)

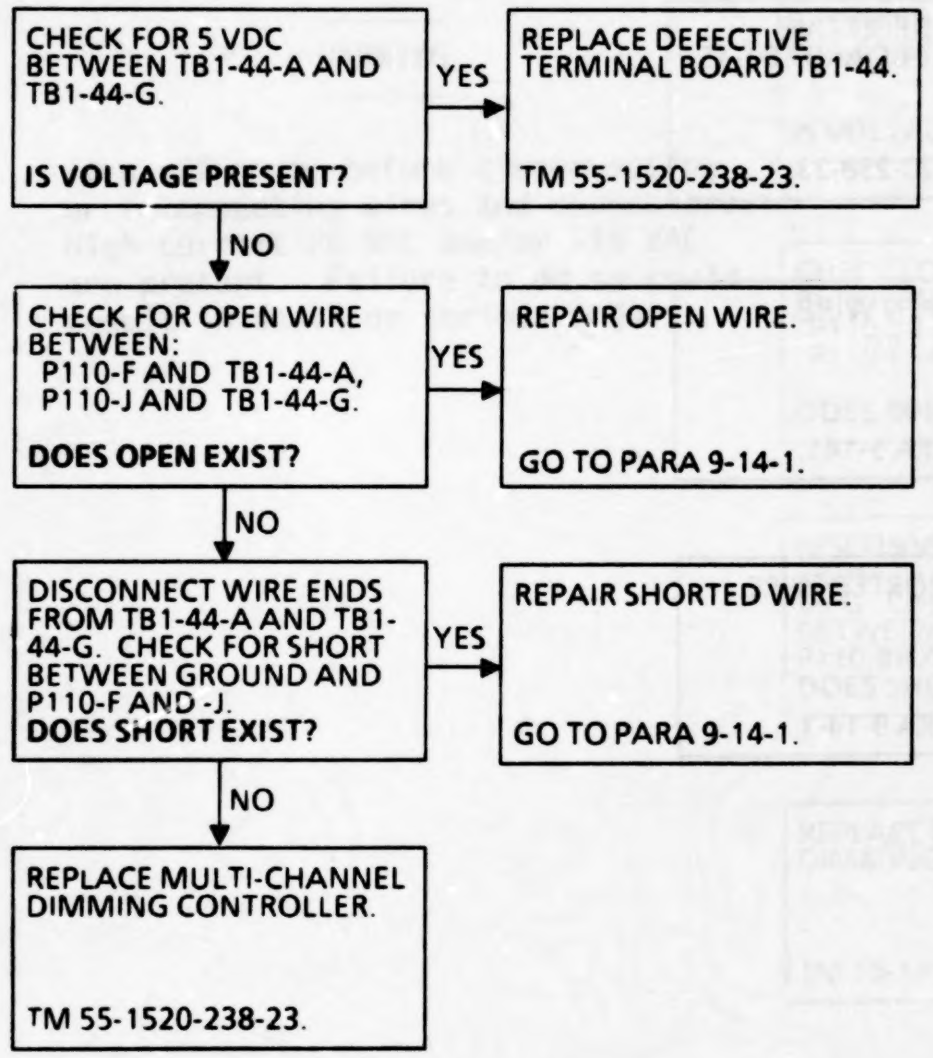
Personnel Required: (para 9-14-8)

References: (para 9-14-8)

Equipment Conditions: (para 9-14-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-44-A AND TB1-44-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-44.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-F AND TB1-44-A,
P110-J AND TB1-44-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
DISCONNECT WIRE ENDS FROM TB1-44-A AND TB1-44-G. CHECK FOR SHORT BETWEEN GROUND AND P110-F AND -J.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-14-11. ALL CH. 3 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-8)

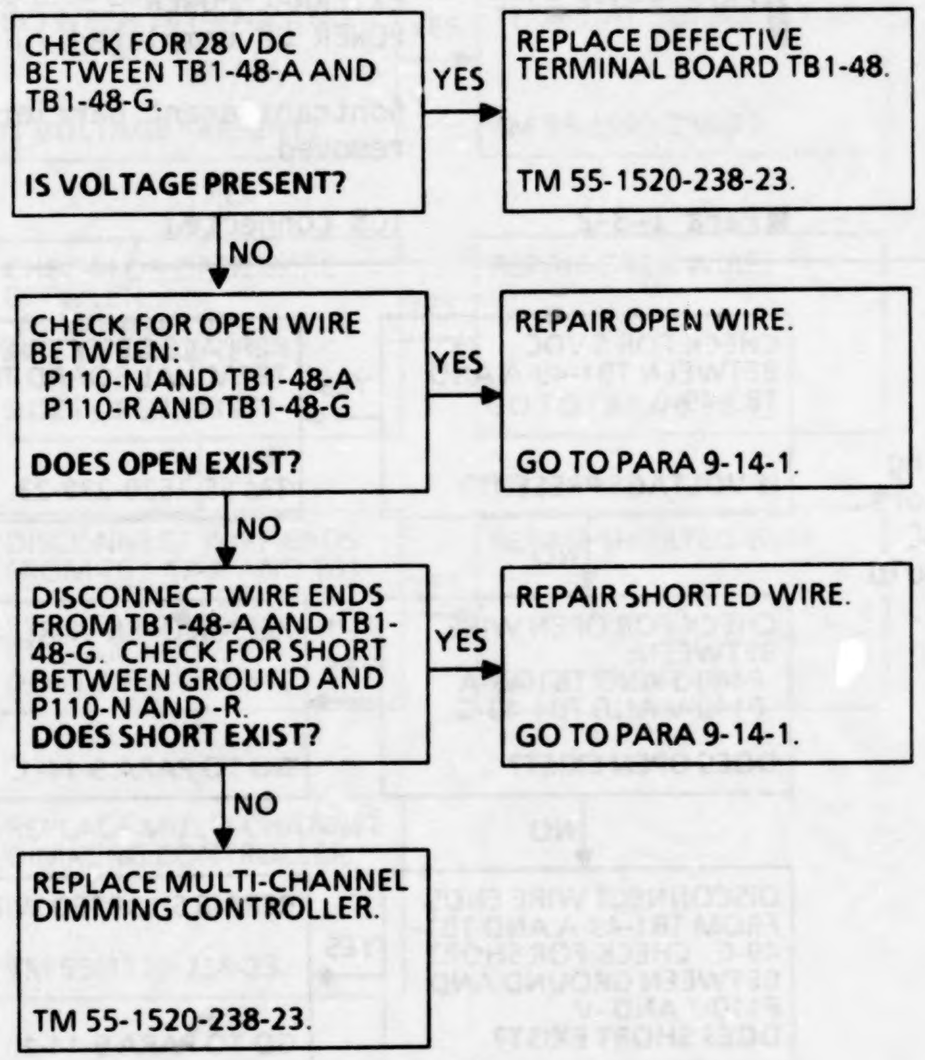
Personnel Required: (para 9-14-8)

References: (para 9-14-8)

Equipment Conditions: (para 9-14-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN TB1-48-A AND TB1-48-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-48.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-N AND TB1-48-A
P110-R AND TB1-48-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
DISCONNECT WIRE ENDS FROM TB1-48-A AND TB1-48-G. CHECK FOR SHORT BETWEEN GROUND AND P110-N AND -R.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-14-12. ALL CH. 3 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

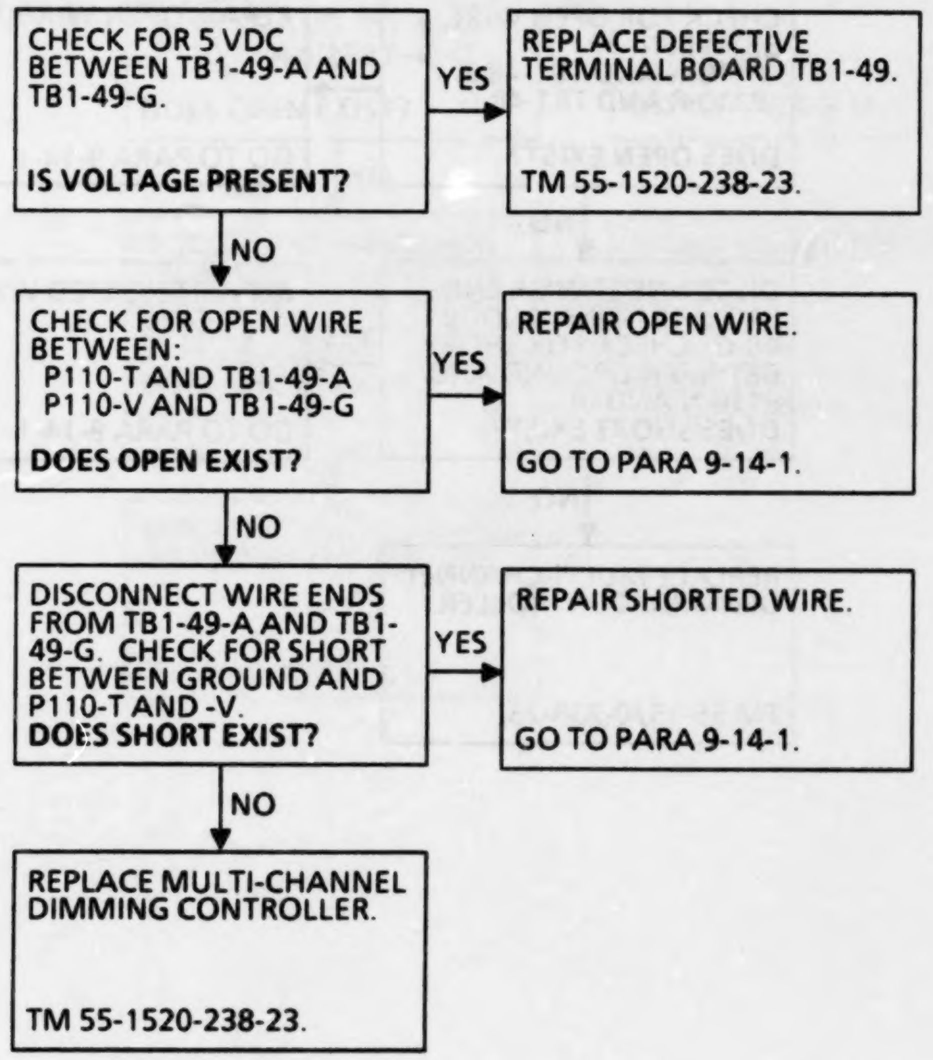
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
	Nontransparent barrier removed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-49-A AND TB1-49-G. IS VOLTAGE PRESENT?

REPLACE DEFECTIVE TERMINAL BOARD TB1-49. TM 55-1520-238-23.

CHECK FOR OPEN WIRE BETWEEN: P110-T AND TB1-49-A P110-V AND TB1-49-G DOES OPEN EXIST?

REPAIR OPEN WIRE. GO TO PARA 9-14-1.

DISCONNECT WIRE ENDS FROM TB1-49-A AND TB1-49-G. CHECK FOR SHORT BETWEEN GROUND AND P110-T AND -V. DOES SHORT EXIST?

REPAIR SHORTED WIRE. GO TO PARA 9-14-1.

REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23.

END OF TASK

9-14-13. ALL CH. 4 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-12)

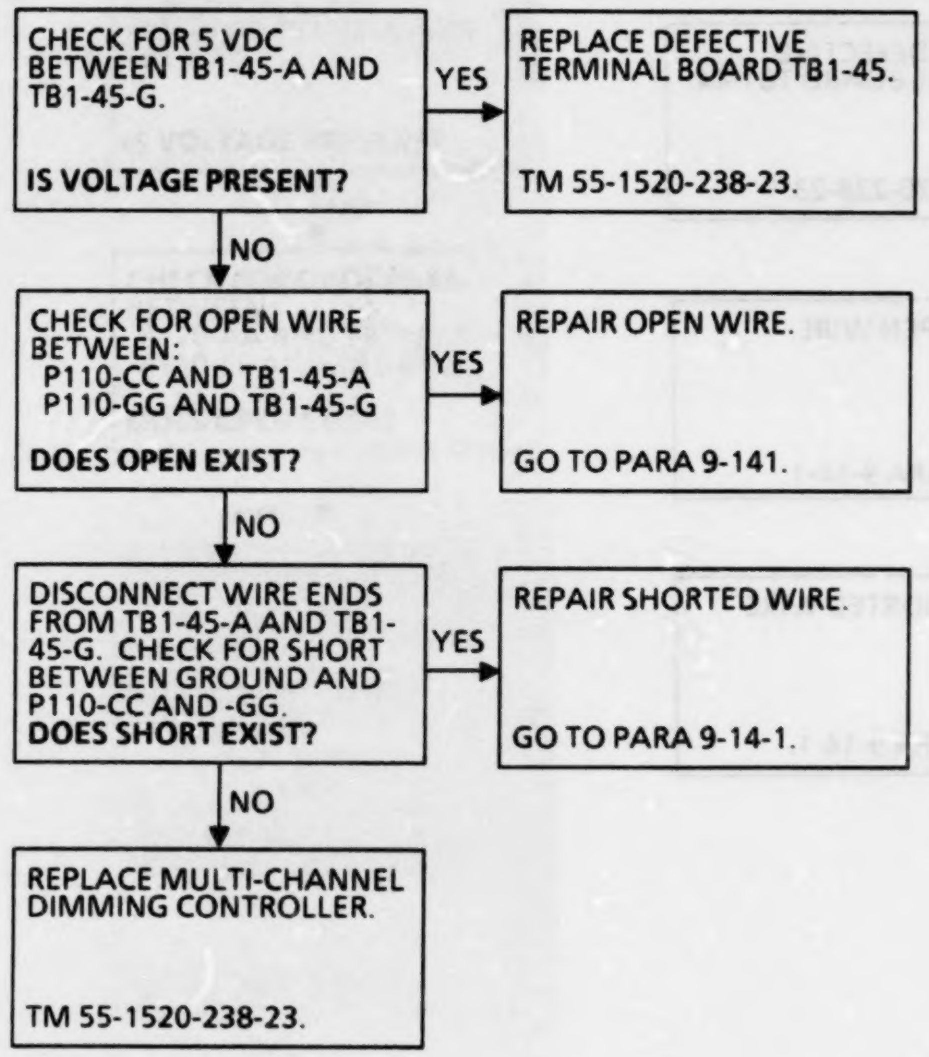
Personnel Required: (para 9-14-12)

References: (para 9-14-12)

Equipment Conditions: (para 9-14-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-45-A AND TB1-45-G. IS VOLTAGE PRESENT?

REPLACE DEFECTIVE TERMINAL BOARD TB1-45. TM 55-1520-238-23.

CHECK FOR OPEN WIRE BETWEEN: P110-CC AND TB1-45-A P110-GG AND TB1-45-G DOES OPEN EXIST?

REPAIR OPEN WIRE. GO TO PARA 9-141.

DISCONNECT WIRE ENDS FROM TB1-45-A AND TB1-45-G. CHECK FOR SHORT BETWEEN GROUND AND P110-CC AND -GG. DOES SHORT EXIST?

REPAIR SHORTED WIRE. GO TO PARA 9-14-1.

REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23.

END OF TASK

9-14-14. ALL CH. 4 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-12)

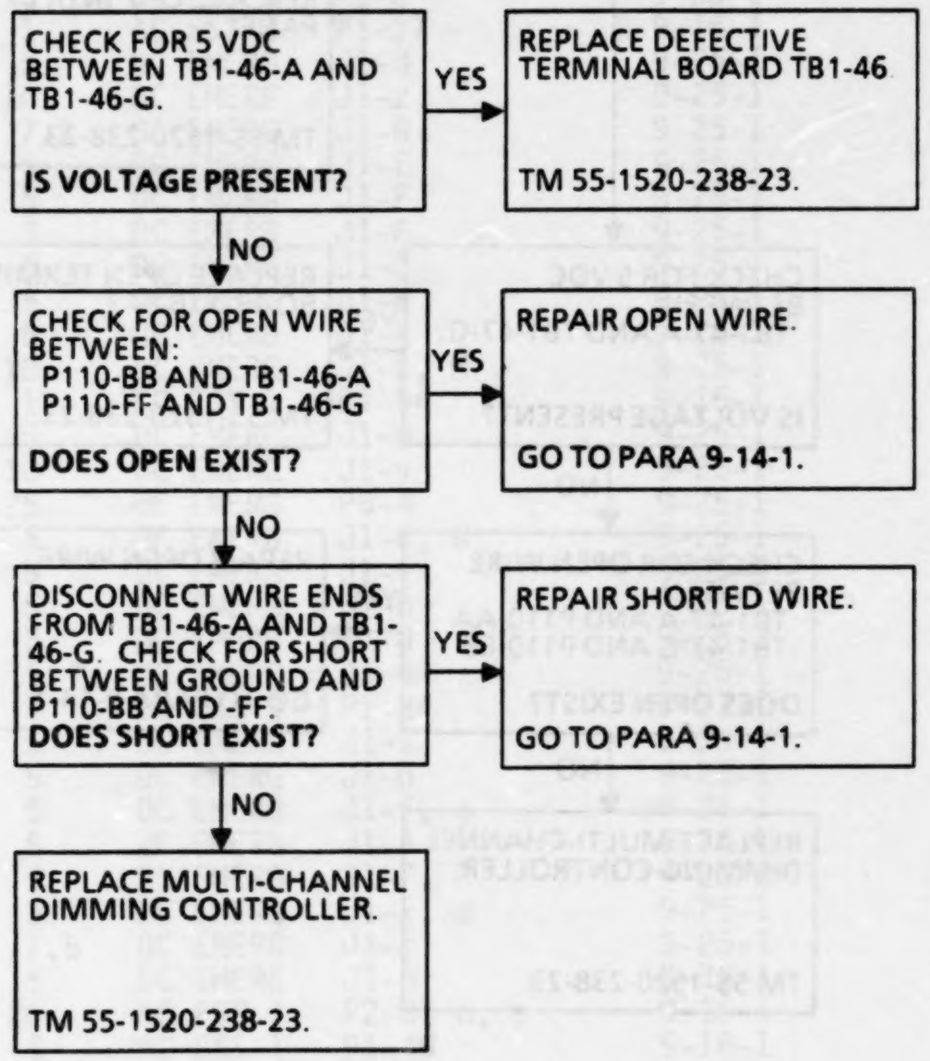
Personnel Required: (para 9-14-12)

References: (para 9-14-12)

Equipment Conditions: (para 9-14-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-46-A AND TB1-46-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-46
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-BB AND TB1-46-A
P110-FF AND TB1-46-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
DISCONNECT WIRE ENDS FROM TB1-46-A AND TB1-46-G. CHECK FOR SHORT BETWEEN GROUND AND P110-BB AND -FF.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-14-15. ALL CH. 4 NO. 3 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-12)

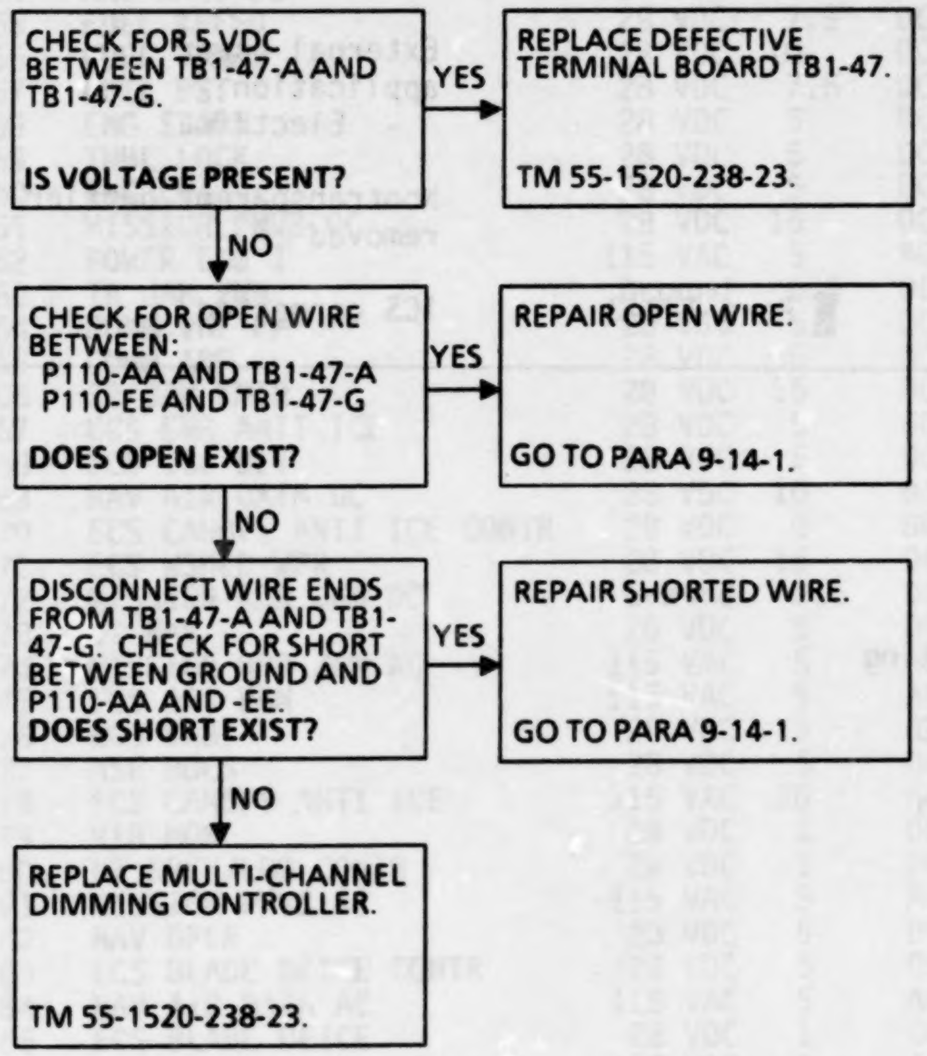
Personnel Required: (para 9-14-12)

References: (para 9-14-12)

Equipment Conditions: (para 9-14-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-47-A AND TB1-47-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-47.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-AA AND TB1-47-A
P110-EE AND TB1-47-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
DISCONNECT WIRE ENDS FROM TB1-47-A AND TB1-47-G. CHECK FOR SHORT BETWEEN GROUND AND P110-AA AND -EE.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-14-16. CPG INTR LT PANEL EDGE-LIGHT - DOES NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

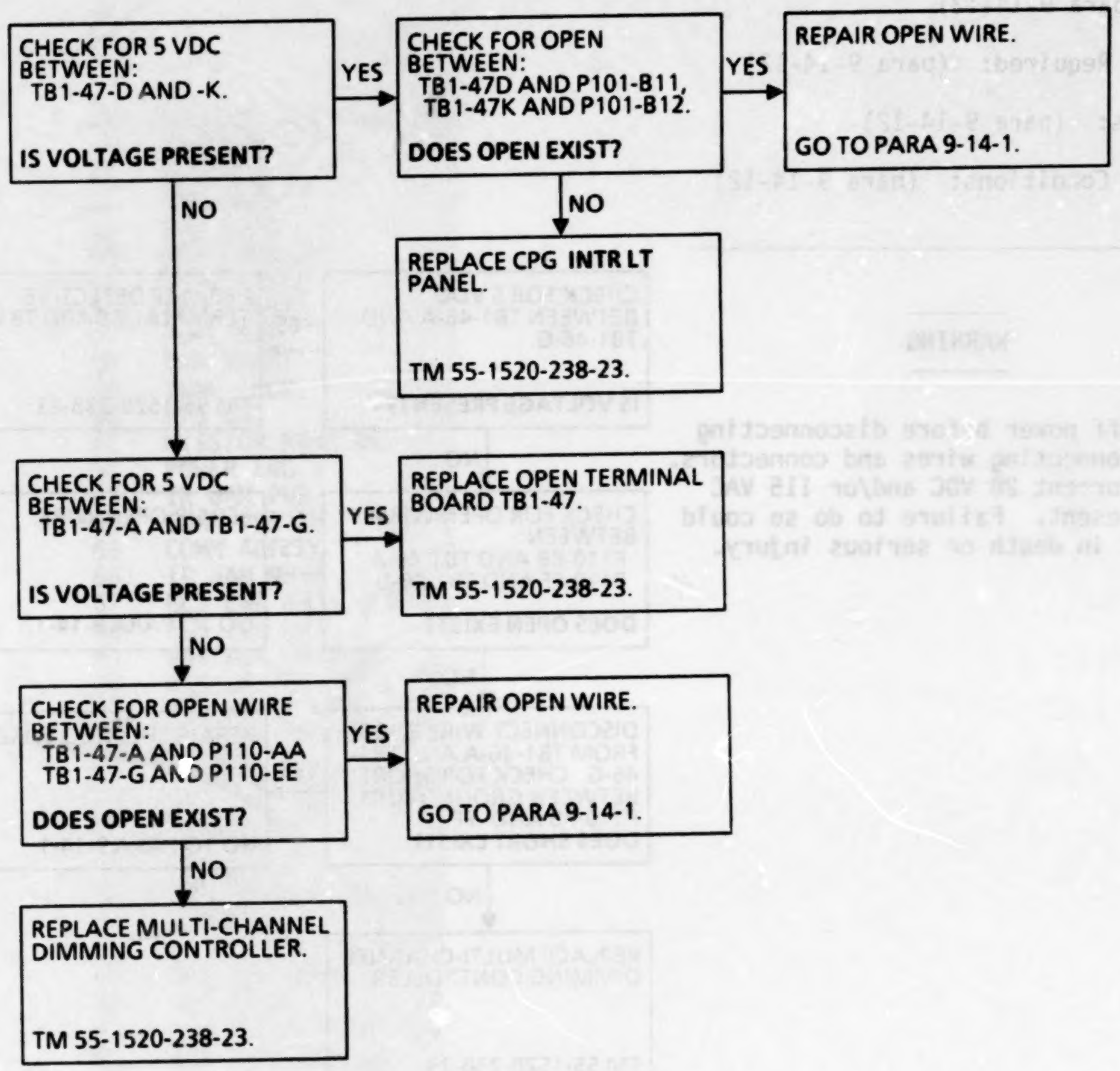
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Nontransparent barrier removed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN: TB1-47-D AND -K. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: TB1-47D AND P101-B11, TB1-47K AND P101-B12. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-14-1.
NO
REPLACE CPG INTR LT PANEL. TM 55-1520-238-23.
NO
CHECK FOR 5 VDC BETWEEN: TB1-47-A AND TB1-47-G. IS VOLTAGE PRESENT?
YES
REPLACE OPEN TERMINAL BOARD TB1-47. TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: TB1-47-A AND P110-AA TB1-47-G AND P110-EE DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23.

END OF TASK

9-15-1. CIRCUIT BREAKER REFERENCE LIST

CB NO.	NAME	POWER		BUS (OR TYPE)	CIRCUIT BREAKER OUTPUT	MOC PARA NO.
		VOLTAGE	AMPS			
	PILOT CIRCUIT BREAKER PANEL (A76)					
1	POWER XFMR RECT 1	115 VAC	35	AC ESS 1	P3-S, T, U	9-16-1
2	STAB AUTO AC	115 VAC	7.5	AC ESS 1	P1-36	9-16-1
3	STAB AUTO DC	28 VDC	15	DC ESS 3	P2-f	9-23-1
4	POWER XFMR RECT 2	115 VAC	35	AC ESS 2	P4-D, E, F	9-18-1
5	POWER BATT CHGR DC	28 VDC	20	DC ESS 1	P2-a	9-20-1
6	STAB MAN DC	28 VDC	15	DC ESS 1	P2-g	9-20-1
7	STAB MAN AC	115 VAC	1	AC ESS 1	P1-37	9-16-1
8	THROT	28 VDC	5	DC EMERG	J1-d	9-25-1
9	FUEL APU	28 VDC	10	DC EMERG	J1-z	9-25-1
10	APU HOLD	28 VDC	7.5	DC EMERG	J1-B	9-25-1
11	FIRE DETR APU	28 VDC	5	DC EMERG	J1-E	9-25-1
12	FIRE DETR ENG 1	28 VDC	5	DC EMERG	J1-F	9-25-1
13	FIRE DETR ENG 2	28 VDC	5	DC EMERG	J1-G	9-25-1
14	FUEL VLV ACTR	28 VDC	5	DC EMERG	J1-C	9-25-1
15	FIRE EXTGH CPG	28 VDC	5	DC EMERG	J1-H	9-25-1
16	ENG LVR	28 VDC	5	DC EMERG	J1-K	9-25-1
17	ENG INST	28 VDC	10	DC EMERG	J1-L, M	9-25-1
18	ASE AC	115 VAC	1	AC ESS 1	P1-54	9-16-1
19	STBY ATTD	28 VDC	5	DC EMERG	J1-e	9-25-1
21	LT CAUT	28 VDC	10	DC EMERG	J1-y	9-25-1
22	LT SRCH/LDG	28 VDC	25	DC EMERG	P5-4	9-25-1
23	LT UTIL SEC	28 VDC	5	DC EMERG	J1-U, W	9-25-1
24	COMM UHF AM	28 VDC	5	DC EMERG	J1-v	9-25-1
25	FIRE EXTGH PLT	28 VDC	5	DC EMERG	J1-D	9-25-1
26	FIRE EXTGH APU	28 VDC	5	DC EMERG	J1-J	9-25-1
27	COMM ICS	28 VDC	5	DC EMERG	J1-a	9-25-1
28	ASE DC	28 VDC	5	DC ESS 3	P1-34	9-23-1
29	COMM IFF	28 VDC	5	DC EMERG	J1-S	9-25-1
30	COMM KY28	28 VDC	5	DC EMERG	J1-p	9-25-1
31	RDR ALT	28 VDC	5	DC EMERG	J1-f, g	9-25-1
32	FUEL FILL	28 VDC	5	DC EMERG	J1-A	9-25-1
34	JETT	28 VDC	5	DC EMERG	J1-P, R	9-25-1
35	EMERG HYD	28 VDC	5	DC EMERG	J1-k, m	9-25-1
36	PITOT HTR	28 VDC	7.5	DC EMERG	J1-s	9-25-1
37	RTR BRK	28 VDC	5	DC EMERG	J1-n	9-25-1
38	ECS L NOSE GRBX HTR	115 VAC	20	AC ESS 1	P2-m, n, p	9-16-1
39	LT PRI	115 VAC	5	AC ESS 1	P1-45	9-16-1
40	LT ANTI COL	115 VAC	5	AC ESS 1	P1-44	9-16-1
41	MISSION IHADSS	115 VAC	5	AC ESS 1	P1-11, 12, 13	9-16-1
42	NAV HARS AC	115 VAC	5	AC ESS 1	P1-38, 39, 40	9-16-1
43	NAV HSI	115 VAC	5	AC ESS 1	P1-26	9-16-1
44	POWER ENG 2	115 VAC	5	AC ESS 2	P1-23	9-18-1
45	MISSION SYM GEN	115 VAC	5	AC ESS 1	P1-52	9-16-1
46	MISSION ARM CONTR	28 VDC	10	DC ESS 2	P2-E	9-22-1
47	MISSION RKT ELEX	28 VDC	5	DC ESS 3	P1-27	9-23-1
48	CHAFF	28 VDC	10	DC EMERG	J1-t	9-25-1
	PILOT CIRCUIT BREAKER PANEL (A76) (cont)					
49	MISSION PEN AIDS CONTR	28 VDC	1	DC ESS 2	P1-49	9-22-1
50	MISSION FC DC	28 VDC	5	DC ESS 3	P1-17	9-23-1
51	MISSION FC AC	115 VAC	5	AC ESS 1	P1-28	9-16-1
52	ENG WARN	28 VDC	5	DC EMERG	J1-N	9-25-1
53	RDR WARN	28 VDC	5	DC EMERG	J1-q	9-25-1
54	NAV HARS DC	28 VDC	5	DC ESS 3	P1-46	9-23-1
55	FUEL XFEED	28 VDC	7.5	DC EMERG	P1-32	9-25-1
56	FUEL TRANS	28 VDC	10	DC ESS 2	P2-D	9-22-1
57	FUEL BST	28 VDC	7.5	DC ESS 2	P1-31, 48	9-22-1
58	ENG START	28 VDC	5	DC EMERG	J1-X, c	9-25-1
59	TWHL LOCK	28 VDC	5	DC ESS 2	P1-15	9-22-1
60	ENG CUT	28 VDC	5	DC EMERG	J1-b	9-25-1
61	MISSION PNVS DC	28 VDC	15	DC ESS 3	P2-k	9-23-1
62	POWER ENG 1	115 VAC	5	AC ESS 1	P1-22	9-16-1
63	IR JAM PWR	Ground	0.5	DC GND	P1-50	9-27-1
64	COMM VHF FM	28 VDC	5	DC EMERG	J1-w	9-25-1
65	COMM ADF	28 VDC	5	DC EMERG	J1-r	9-25-1
66	IR JAM XMTR	28 VDC	15	DC ESS 2	P2-h	9-22-1
67	ECS ENG ANTI ICE	28 VDC	5	DC ESS 1	P1-4	9-20-1
68	ECS ICE DET	28 VDC	5	DC ESS 3	P1-47	9-23-1
69	NAV AIR DATA DC	28 VDC	10	DC ESS 3	P2-J	9-23-1
70	ECS CANOPY ANTI ICE CONTR	28 VDC	5	DC ESS 1	P1-3	9-20-1
71	ECS WSHLD WPR	28 VDC	15	DC ESS 1	P2-b	9-20-1
72	MISSION RDR JAM DC	Ground	0.5	DC GND	P1-1	9-27-1
73	LT NAV	28 VDC	5	DC ESS 2	P1-25	9-22-1
74	MISSION RDR JAM AC	115 VAC	5	AC ESS 1	P1-5, 6, 7	9-16-1
75	ECS AFT FAN	115 VAC	5	AC ESS 2	P2-A, B, C	9-18-1
76	ECS CAB	28 VDC	5	DC EMERG	P1-2	9-25-1
77	ASE BUCS	28 VDC	5	DC ESS 3	P1-33	9-23-1
78	ECS CANOPY ANTI ICE	115 VAC	20	AC ESS 2	P2-c, d, e	9-18-1
79	VIB MON	28 VDC	5	DC ESS 2	P1-10	9-22-1
80	LT SRCH/LDG CONTR	28 VDC	5	DC EMERG	J1-V	9-25-1
81	MISSION PNVS AC	115 VAC	5	AC ESS 1	P2-N, P, R	9-16-1
82	NAV DPLR	28 VDC	5	DC ESS 3	P1-51	9-23-1
83	ECS BLADE DEICE CONTR	28 VDC	5	DC ESS 3	P1-14	9-23-1
84	NAV AIR DATA AC	115 VAC	5	AC ESS 1	P2-F, G, H	9-16-1
85	ECS BLADE DEICE	28 VDC	1	DC ESS 3	P1-53	9-23-1
86	POWER BATT CHGR AC	115 VAC	5	AC ESS 2	P1-35	9-18-1
87	TRIM	28 VDC	5	DC EMERG	J1-Y, Z	9-25-1
88	ECS FAB FANS	115 VAC	7.5	AC ESS 2	P2-K, L, M	9-18-1
89	MISSION JETT	28 VDC	5	DC ESS 2	P1-18	9-22-1
90	LT FORM	115 VAC	5	AC ESS 1	P1-24	9-16-1
91	NAV VDU	28 VDC	5	DC ESS 2	P1-41, 42	9-22-1
92	MISSION EL AC	115 VAC	5	AC ESS 1	P1-30	9-16-1
93	MISSION EL DC	28 VDC	5	DC ESS 2	P1-29	9-22-1
94	CBR BLWR	28 VAC	5	DC ESS 1	P1-19	9-20-1

GO TO NEXT PAGE

9-15-1. CIRCUIT BREAKER REFERENCE LIST (cont)

CB NO.	NAME	POWER VOLTAGE	POWER AMPS	BUS (OR TYPE)	CIRCUIT BREAKER OUTPUT	MOC PARA NO.
PILOT CIRCUIT BREAKER PANEL (A76) (cont)						
211	ECS R NOSE GRBX HTR	115 VAC	20	AC ESS 1	P2-q, r, s	9-16-1
212	ECS ICE DET HTR	115 VAC	3	AC ESS 2	P1-9	9-16-1
CPG CIRCUIT BREAKER PANEL NO. 1 (A77)						
1	MUX L PYL INBD	28 VDC	5	DC ESS 3	P2-9	9-24-1
2	MUX L PYL OUTBD	28 VDC	5	DC ESS 3	J2-11	9-24-1
3	AWS MTR	115 VAC	30	AC ESS 2	J3-4, 5, 6	9-19-1
4	FC FCC DC	28 VDC	7.5	DC ESS 3	J2-32	9-24-1
5	MUX R PYL INBD	28 VDC	5	DC ESS 3	J2-8	9-24-1
6	MUX R PYL OUTBD	28 VDC	5	DC ESS 3	J2-10	9-24-1
7	AWS AMMO	115 VAC	15	AC ESS 2	J2-1, 15, 22	9-19-1
8	FC RC DR	115 VAC	5	AC ESS 2	J2-16	9-19-1
9	MUX FAB R	28 VDC	5	DC ESS 3	J2-13	9-24-1
10	MUX FAB L	28 VDC	5	DC ESS 3	J2-14	9-24-1
11	AWS AWS AC	115 VAC	5	AC ESS 1	J2-12, 19	9-17-1
12	AWS AWS DC	28 VDC	5	DC ESS 3	J2-24, 33	9-24-1
13	EMERG BATT ICS	28 VDC	5	DC EMERG	J1-5	9-26-1
14	PRI LT	115 VAC	5	AC ESS 2	J1-9	9-19-1
15	MUX CPG	28 VDC	5	DC ESS 3	J2-7	9-24-1
16	FC FCC AC	115 VAC	5	AC ESS 1	J2-35	9-17-1
17	MSL DC ELEC	28 VDC	5	DC ESS 3	J2-21, 20	9-24-1
18	MSL R OUTBD LCHR AC	115 VAC	2	AC ESS 1	J2-5	9-17-1
19	MSL R OUTBD LCHR DC	Ground	0.5	DC GND	J2-18	9-28-1
20	AFTD IND	115 VAC	5	AC ESS 1	J1-6	9-17-1
21	MSL R INBD LCHR AC	115 VAC	2	AC ESS 1	J2-4	9-17-1
22	MSL R INBD LCHR DC	Ground	0.5	DC GND	J2-25	9-28-1
23	MSL L INBD LCHR DC	Ground	0.5	DC GND	J2-6	9-28-1
24	MSL L INBD LCHR AC	115 VAC	2	AC ESS 1	J2-3	9-17-1
25	MSL L OUTBD LCHR DC	Ground	0.5	DC GND	J2-17	9-28-1
26	MSL L OUTBD LCHR AC	115 VAC	2	AC ESS 1	K2-2	9-17-1
27	MSL ARM	Ground	0.5	DC GND	J2-23	9-28-1
28	EMERG BATT CAUT	28 VDC	7.5	DC EMERG	J1-4	9-26-1
29	EMERG BATT UTIL SEC LT	28 VDC	5	DC EMERG	J1-2, 3	9-26-1
31	EMERG BATT ENG INST	28 VDC	10	DC EMERG	J1-10, 8	9-26-1
32	EMERG BATT VHF AM/FM	28 VDC	5	DC EMERG	J1-7	9-26-1

CB NO.	NAME	POWER VOLTAGE	POWER AMPS	BUS (OR TYPE)	CIRCUIT BREAKER OUTPUT	MOC PARA NO.
CPG CIRCUIT BREAKER PANEL NO. 2 (A97)						
1	IHADSS	115 VAC	5	AC ESS 1	P1-C, D, E	9-17-1
2	TADS DC	28 VDC	5	DC ESS 1	J1-C, G, L, M	9-21-1
3	TADS AC	115 VAC	10	AC ESS 1	J1-E, F, H	9-17-1
4	LASER	115 VAC	2	AC ESS 1	J1-A, B, D	9-17-1
5	CBR BLWR	28 VDC	5	DC ESS 1	J1-K	9-21-1
6	CDU	28 VDC	5	DC ESS 3	P1-H	9-24-2
UTILITY POWER DISTRIBUTION CIRCUIT BREAKERS (A3)						
6	AC ELEC UTIL PWR	115 VAC	10	AC ESS 2	J16-E, F, B	9-2-2
7	DC ELEC UTIL PWR	28 VDC	35	DC ESS 1	J16-A	9-3-1
94	NITROGEN INERT	115 VAC	5	AC ESS 2	P1085-1	9-5-2
AFT AVIONICS BAY CIRCUIT BREAKERS						
8	MAINT LT	24 VDC	5	BATTERY	J111-A, P463-B3	9-10-1
148	APU	24 VDC	7.5	BATTERY	P430-A4	CHAPTER 15

END OF TASK

9-15-2. PILOT CIRCUIT BREAKER PANEL - ACCESSING, SECURING PROCEDURE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

References:

TM 55-1520-238-23

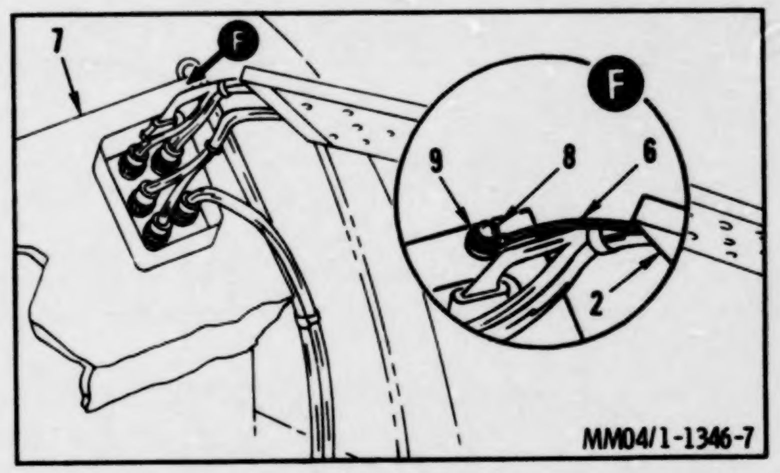
Equipment Conditions:

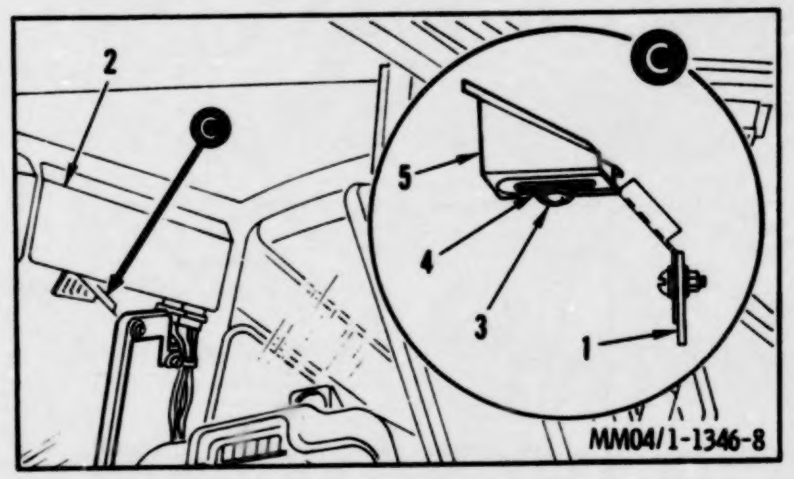
Ref	Condition
TM 55-1520-238-23	Helicopter safed

A. ACCESSING PANEL

1. **Detach left glareshield (1) from pilot circuit breaker panel (2).** Remove one screw (3) and washer (4) that secures glareshield (1) to bracket (5).

2. **Remove bonding strap (6) from airframe (7).** Remove one screw (8) and washer (9).





CAUTION

Remove two aft screws first, then support forward end of panel while removing remaining two screws to prevent damage to transparent barrier or pilot glareshield.

3. **Dismount circuit breaker panel (2).** Remove four screws (13).

4. **Remove back cover (14) from panel (2).** Remove nuts (15) and washers (16) from studs (17) and screws (18) as required.

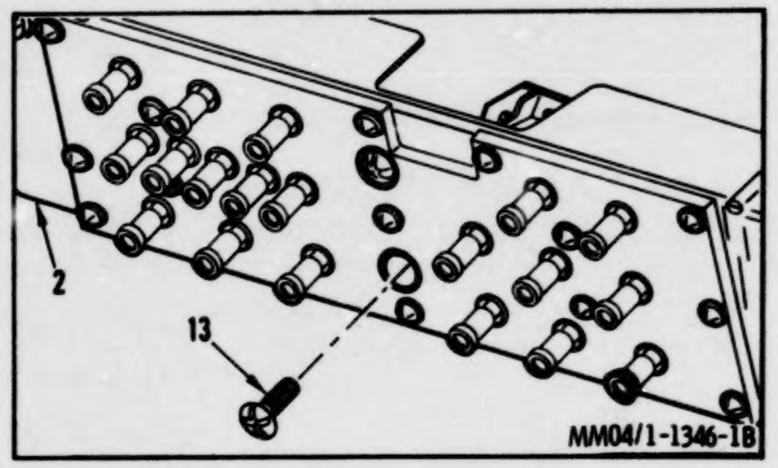
B. SECURING PANEL

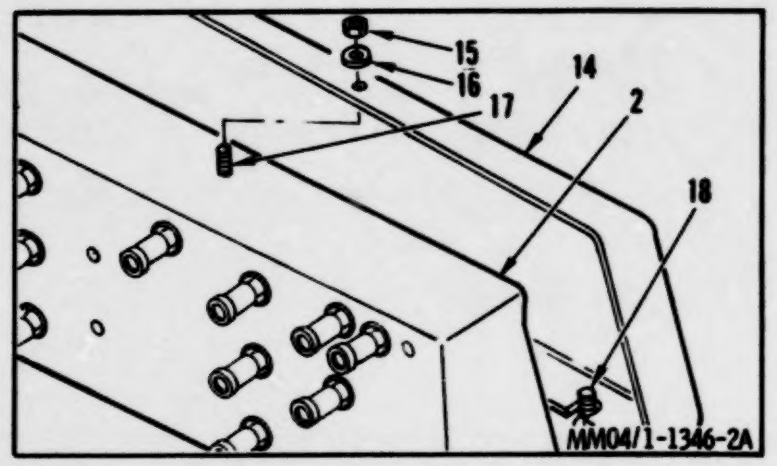
1. **Install back cover (14) on panel (2).**

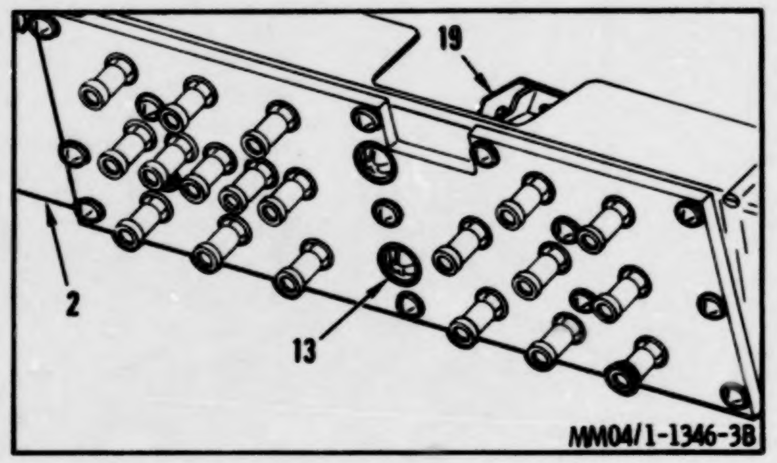
   a. Position cover (14) over studs (17).

   b. Install washers (16) and nuts (15) on studs (17) and screws (18) as required.

2. **Fasten pilot circuit breaker panel (2) to mounting bracket (19).** Install four screws (13).





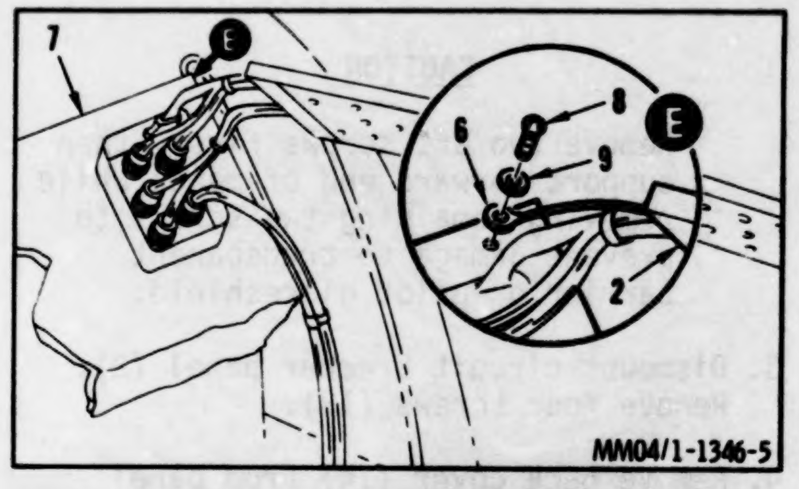


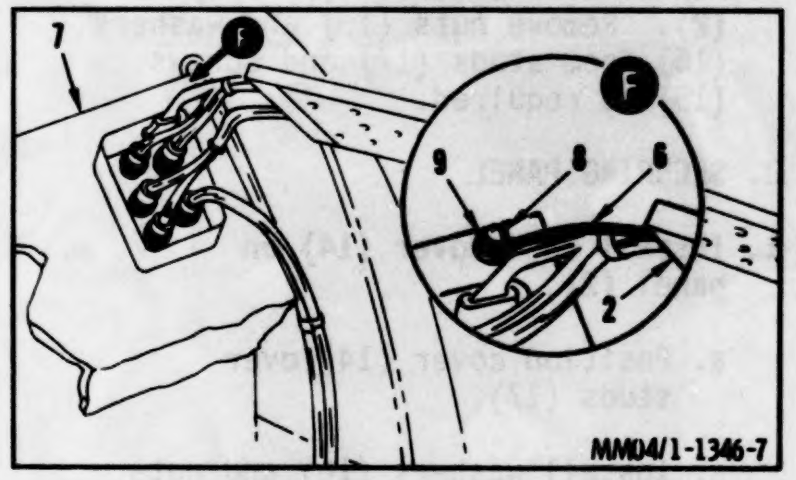
GO TO NEXT PAGE

9-15-2. PILOT CIRCUIT BREAKER PANEL - ACCESSING, SECURING PROCEDURE (cont)

3. Install bonding strap (6) on airframe (7), by installing one screw (8) and washer (9).

4. Fasten left vertical glareshield (1) to circuit breaker panel (2). Install screw (3) and washer (4).


7
E
6
8
9
E
2
MM04/1-1346-5


7
F
F
9
8
6
2
MM04/1-1346-7

END OF TASK

9-16-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

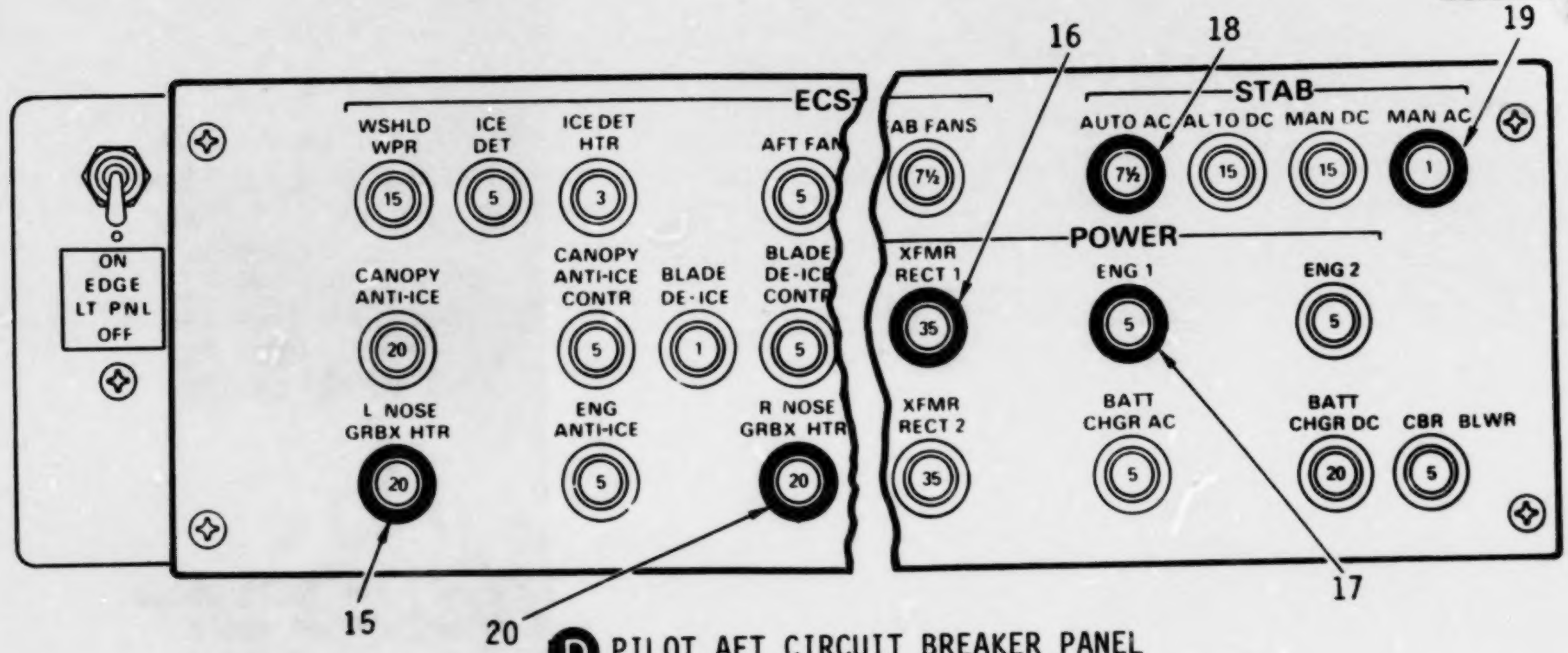
TM 55-1520-238-23

Equipment Conditions:

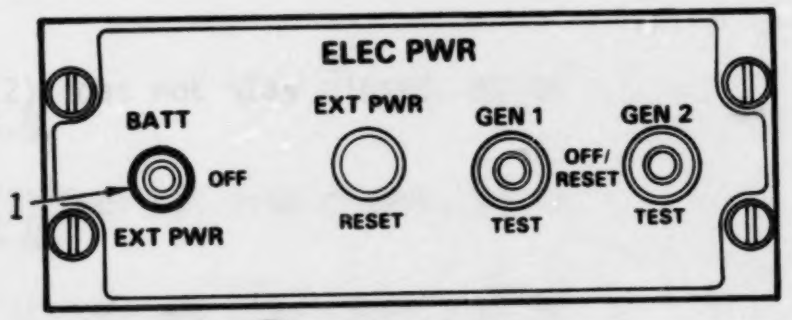
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

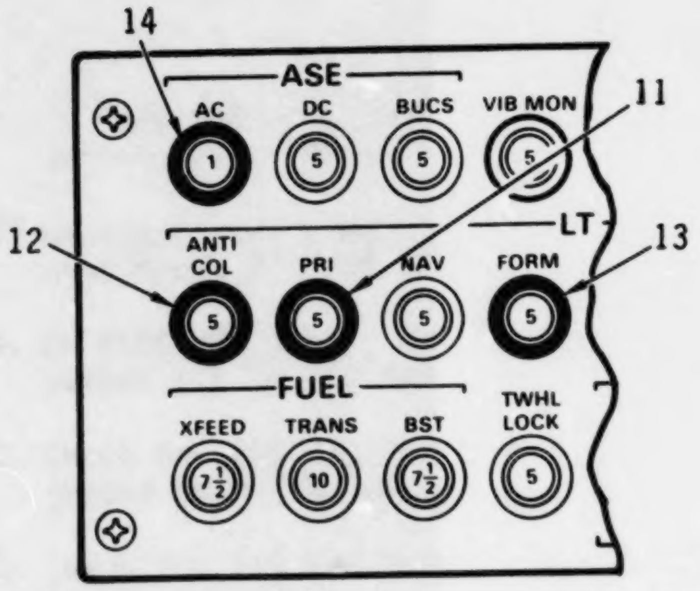
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ECS
WSHLD WPR 15
ICE DET 5
ICE DET HTR 3
AFT FAN 5
CANOPY ANTI-ICE 20
CANOPY ANTI-ICE CONTR 5
BLADE DE-ICE 1
BLADE DE-ICE CONTR 5
L NOSE GRBX HTR 20
ENG ANTI-ICE 5
R NOSE GRBX HTR 20
ON EDGE LT PNL OFF
AB FANS 7½
STAB
AUTO AC 7½
AL TO DC 15
MAN DC 15
MAN AC 1
POWER
XFMR RECT 1 35
ENG 1 5
ENG 2 5
XFMR RECT 2 35
BATT CHGR AC 5
BATT CHGR DC 20
CBR BLWR 5
15
16
17
18
19
20

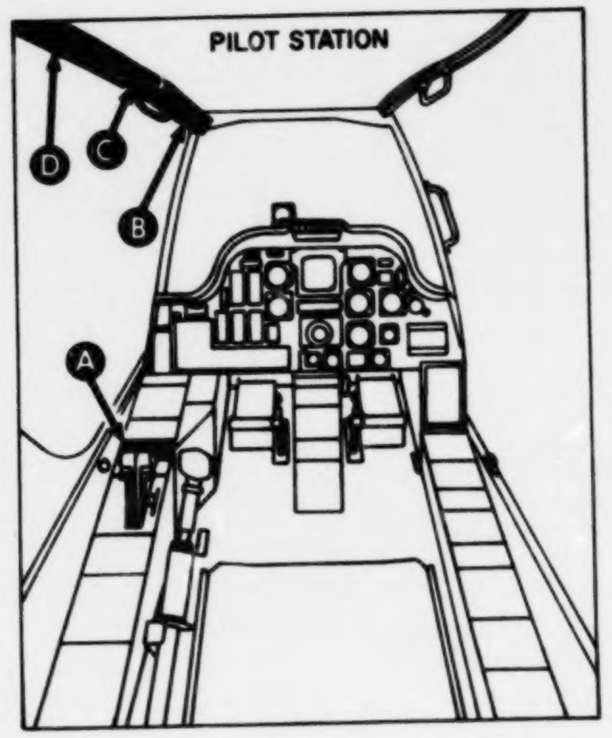
Ⓓ PILOT AFT CIRCUIT BREAKER PANEL

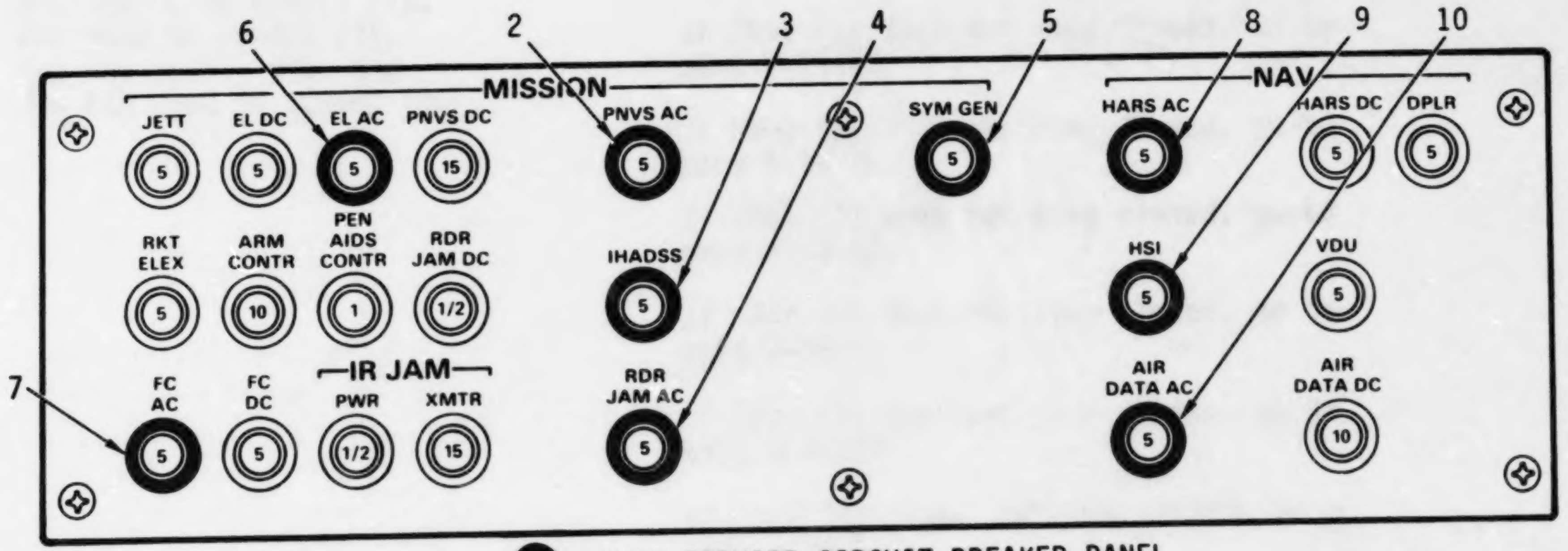

ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
TEST
OFF/RESET
GEN 2
TEST
1

Ⓐ ELEC PWR PANEL


ASE
AC 1
DC 5
BUCS 5
VIB MON 5
LT
ANTI COL 5
PRI 5
NAV 5
FORM 5
FUEL
XFEED 7½
TRANS 10
BST 7½
TWHL LOCK 5
11
12
13
14

Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL


PILOT STATION
A
B
C
D


MISSION
JETT 5
EL DC 5
EL AC 5
PNVS DC 15
PNVS AC 5
RKT ELEX 5
ARM CONTR 10
PEN AIDS CONTR 1
RDR JAM DC 1/2
IHADSS 5
IR JAM
FC AC 5
FC DC 5
PWR 1/2
XMTR 15
RDR JAM AC 5
SYM GEN 5
NAV
HARS AC 5
HARS DC 5
DPLR 5
HSI 5
VDU 5
AIR DATA AC 5
AIR DATA DC 10
2
3
4
5
6
7
8
9
10

Ⓑ PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-1006-1

GO TO NEXT PA

9-16-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK (cont)

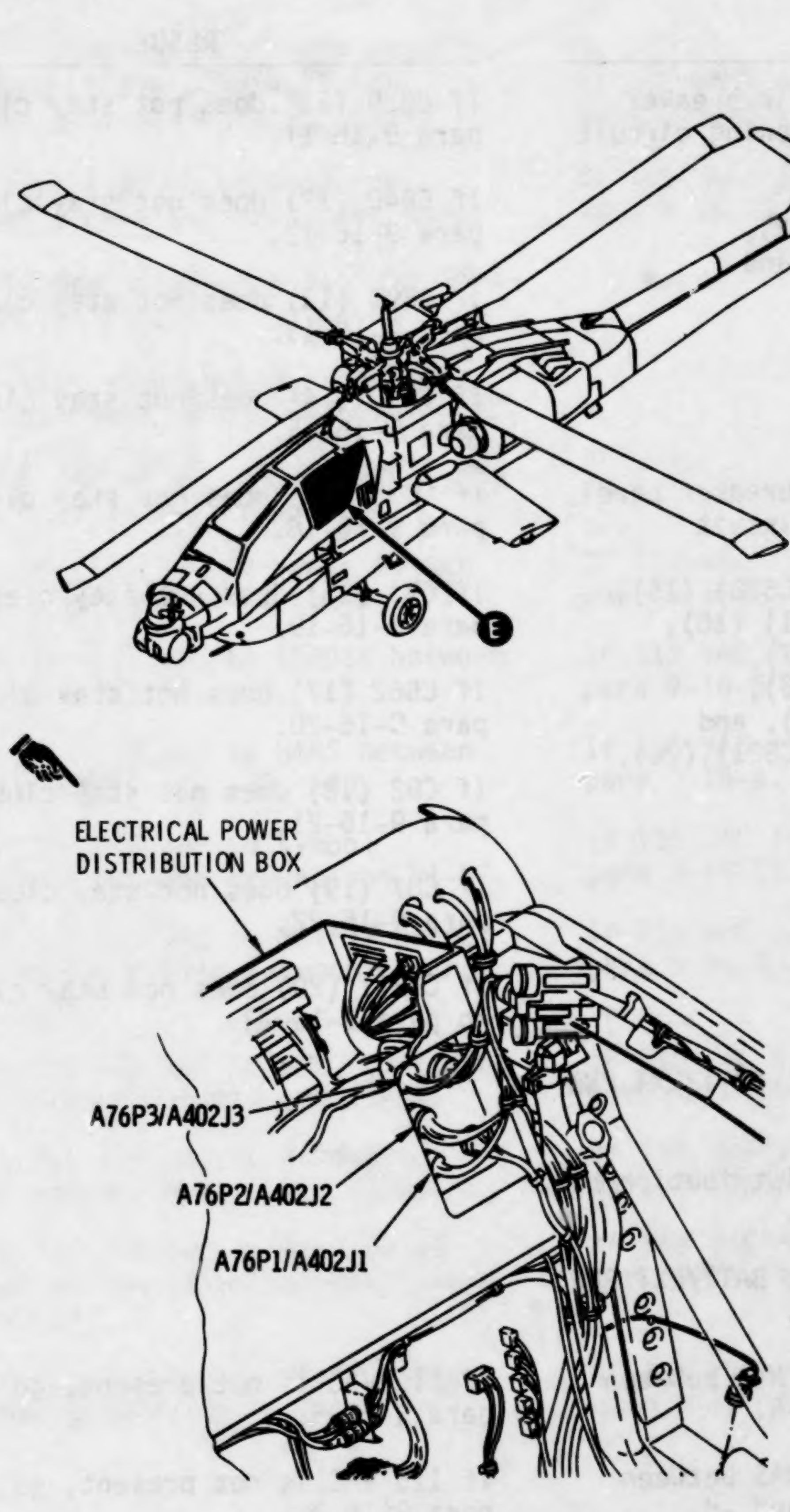
A. On electrical power distribution box, disconnect A76P1, A76P2, and A76P3.

B. Complete operational check as follows:

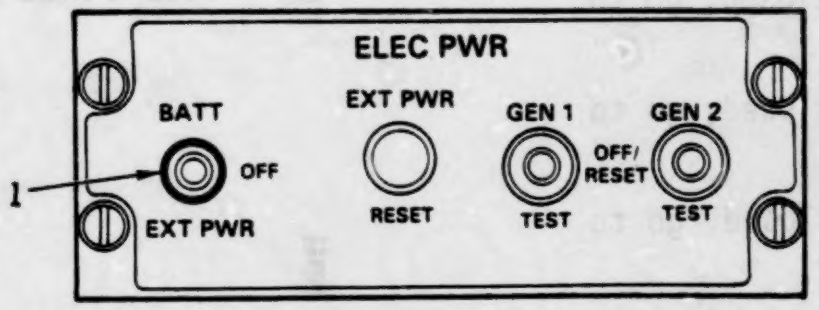
TASK	RESULT
1. Check for short between ground and A76P3-G, -H, -J; -K, -L, -M; -N, -P and -R.	If short exists, go to para 9-16-4.
1.1 On pilot ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
1.2 On electrical power distribution box, check for 115 VAC at A402J3-G, -H, -J, -K, -L, -M, -N, -P and -R.	If 115 VAC is not present, go to para 9-2-2.
2. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF and reconnect A76P3, A76P1, and A76P2.	
3. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
4. On pilot forward circuit breaker panel, close the following circuit breakers: MISSION PNVS AC (CB81) (2), MISSION IHADSS (CB41) (3), MISSION RDR JAM AC (CB74) (4), MISSION SYM GEN (CB45) (5), MISSION EL AC (CB92) (6), MISSION FC AC (CB51) (7), NAV HARS AC (CB42) (8), NAV HSI (CB43) (9), and NAV AIR DATA AC (CB84) (10).	If CB81 (2) does not stay closed, go to para 9-16-5. If CB41 (3) does not stay closed, go to para 9-16-6. If CB74 (4) does not stay closed, go to para 9-16-7. If CB45 (5) does not stay closed, go to para 9-16-10. If CB92 (6) does not stay closed, go to para 9-16-16. If CB51 (7) does not stay closed, go to para 9-16-17. If CB42 (8) does not stay closed, go to para 9-16-9. If CB43 (9) does not stay closed, go to para 9-16-14. If CB84 (10) does not stay closed, go to para 9-16-8.
5. On pilot center circuit breaker panel, close the following circuit breakers: LT PRI (CB37) (11), LT ANTI COL (CB40) (12), LT FORM (CB90) (13), and ASE AC (CB18) (14).	If CB39 (11) does not stay closed, go to para 9-16-11. If CB40 (12) does not stay closed, go to para 9-16-12. If CB90 (13) does not stay closed, go to para 9-16-13. If CB18 (14) does not stay closed, go to para 9-16-15.
6. On pilot aft circuit breaker panel, close the following circuit breakers: ECS L NOSE GRBX HTR (CB38) (15), POWER XFMR RECT 1 (CB1) (16), POWER ENG 1 (CB62) (17), STAB AUTO AC (CB2) (18), STAB MAN AC (CB7) (19), and ECS R NOSE GRBX HTR (CB211)(20).	If CB38 (15) does not stay closed, go to para 9-16-18. If CB1 (16) does not stay closed, go to para 9-16-19. If CB62 (17) does not stay closed, go to para 9-16-20. If CB2 (18) does not stay closed, go to para 9-16-21. If CB7 (19) does not stay closed, go to para 9-16-22. If CB211 (20) does not stay closed, go to para 9-16-23.
7. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.	
8. On electrical power distribution box, disconnect P2 from J2.	
9. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
10. Check for 115 VAC to PNVS between ground and P2-N, -P, -R.	If 115 VAC is not present, go to para 9-16-5.
11. Check for 115 VAC to OAS between ground and P2-F, -G, and -H.	If 115 VAC is not present, go to para 9-16-8.

GO TO NEXT PAGE

9-16-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK (cont)


E
ELECTRICAL POWER DISTRIBUTION BOX
A76P3/A402J3
A76P2/A402J2
A76P1/A402J1

E PILOT STATION (LEFT CONSOLE)


ELEC PWR
BATT
1
OFF
EXT PWR
EXT PWR
RESET
GEN 1
OFF/RESET
TEST
GEN 2
TEST

PILOT ELEC PWR PANEL

MM04/1-1006-2B

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

GO TO NEXT PAGE

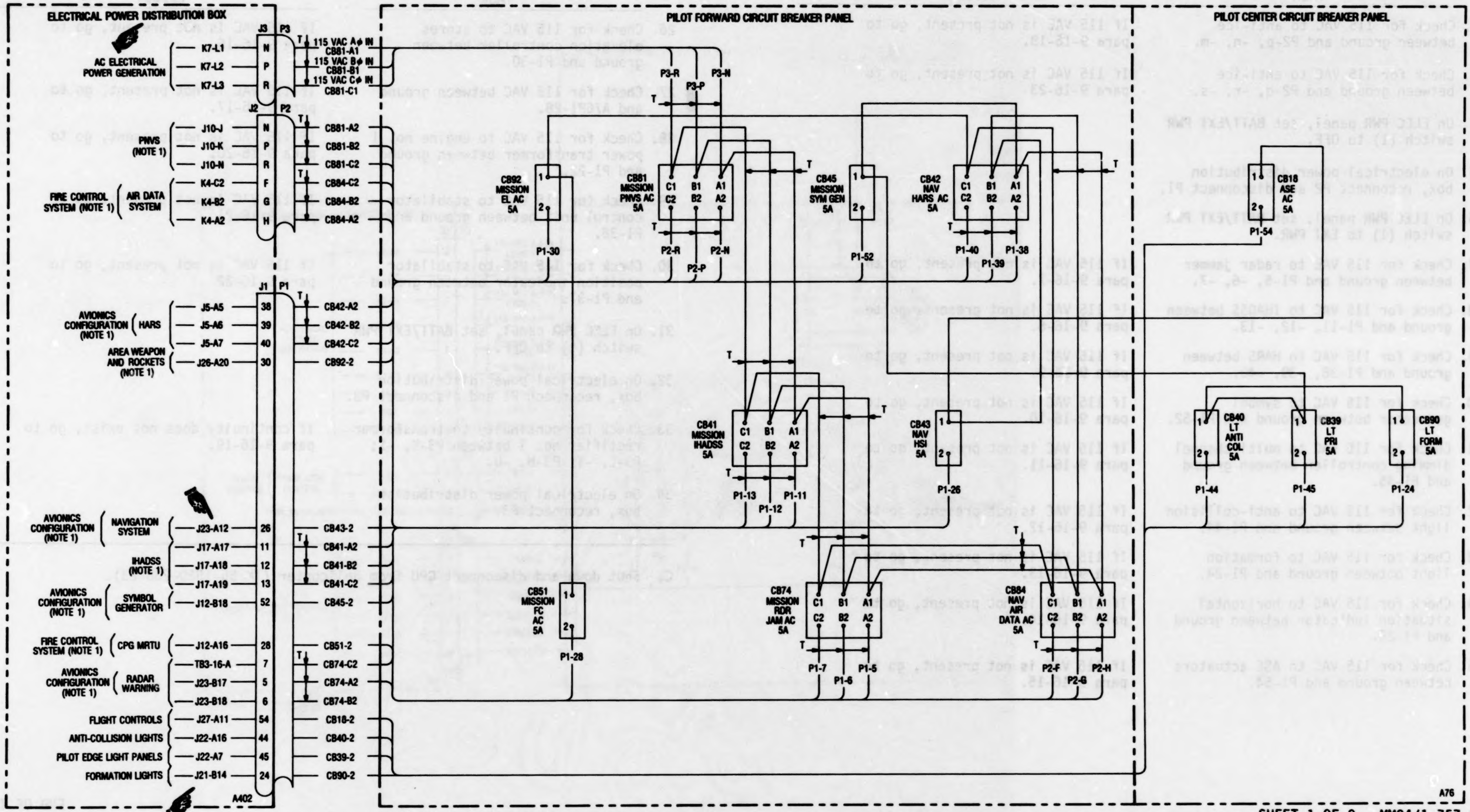
9-16-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK (cont)

TASK	RESULT
12. Check for 115 VAC to anti-ice between ground and P2-p, -n, -m.	If 115 VAC is not present, go to para 9-16-18.
13. Check for 115 VAC to anti-ice between ground and P2-q, -r, -s.	If 115 VAC is not present, go to para 9-16-23.
14. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.	
15. On electrical power distribution box, reconnect P2 and disconnect P1.	
16. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
17. Check for 115 VAC to radar jammer between ground and P1-5, -6, -7.	If 115 VAC is not present, go to para 9-16-7.
18. Check for 115 VAC to IHADSS between ground and P1-11, -12, -13.	If 115 VAC is not present, go to para 9-16-6.
19. Check for 115 VAC to HARS between ground and P1-38, -39, -40.	If 115 VAC is not present, go to para 9-16-9.
20. Check for 115 VAC to symbol generator between ground and P1-52.	If 115 VAC is not present, go to para 9-16-10.
21. Check for 115 VAC to multi-channel dimming controller between ground and P1-45.	If 115 VAC is not present, go to para 9-16-11.
22. Check for 115 VAC to anti-collision light between ground and P1-44.	If 115 VAC is not present, go to para 9-16-12.
23. Check for 115 VAC to formation light between ground and P1-24.	If 115 VAC is not present, go to para 9-16-13.
24. Check for 115 VAC to horizontal situation indicator between ground and P1-26.	If 115 VAC is not present, go to para 9-16-14.
25. Check for 115 VAC to ASE actuators between ground and P1-54.	If 115 VAC is not present, go to para 9-16-15.
26. Check for 115 VAC to stores elevation controller between ground and P1-30.	If 115 VAC is not present, go to para 9-16-16.
27. Check for 115 VAC between ground and A76P1-28.	If 115 VAC is not present, go to para 9-16-17.
28. Check for 115 VAC to engine no. 1 power transformer between ground and P1-22.	If 115 VAC is not present, go to para 9-16-20.
29. Check for 115 VAC to stabilator control unit between ground and P1-36.	If 115 VAC is not present, go to para 9-16-21.
30. Check for 115 VAC to stabilator position indicator between ground and P1-37.	If 115 VAC is not present, go to para 9-16-22.
31. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.	
32. On electrical power distribution box, reconnect P1 and disconnect P3.	
33. Check for continuity to transformer rectifier no. 1 between P3-K, -S; P3-L, -T; P3-M, -U	If continuity does not exist, go to para 9-16-19.
34. On electrical power distribution box, reconnect P3.	

C. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

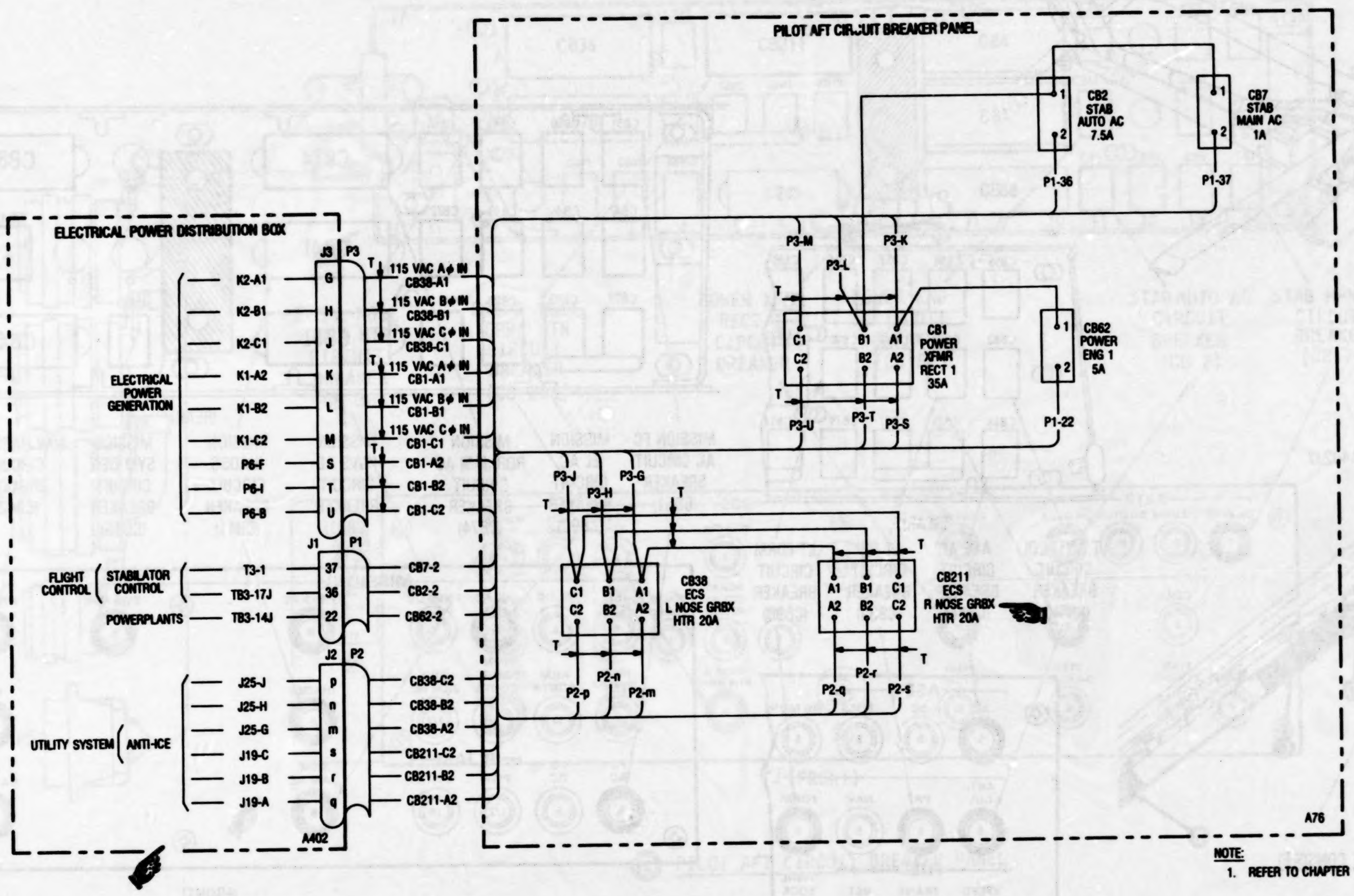
END OF TASK

9-16-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - INTERCONNECTION DIAGRAM


ELECTRICAL POWER DISTRIBUTION BOX
AC ELECTRICAL POWER GENERATION
K7-L1
K7-L2
K7-L3
J3
P3
N
P
R
T
115 VAC Aϕ IN
CB81-A1
115 VAC Bϕ IN
CB81-B1
115 VAC Cϕ IN
CB81-C1
J2
P2
PNVS (NOTE 1)
J10-J
J10-K
J10-N
CB81-A2
CB81-B2
CB81-C2
FIRE CONTROL SYSTEM (NOTE 1)
AIR DATA SYSTEM
K4-C2
K4-B2
K4-A2
F
G
H
CB84-C2
CB84-B2
CB84-A2
J1
P1
AVIONICS CONFIGURATION (NOTE 1)
HARS
J5-A5
J5-A6
J5-A7
38
39
40
CB42-A2
CB42-B2
CB42-C2
AREA WEAPON AND ROCKETS (NOTE 1)
J26-A20
30
CB92-2
AVIONICS CONFIGURATION (NOTE 1)
NAVIGATION SYSTEM
J23-A12
26
CB43-2
IHADSS (NOTE 1)
J17-A17
J17-A18
J17-A19
11
12
13
CB41-A2
CB41-B2
CB41-C2
AVIONICS CONFIGURATION (NOTE 1)
SYMBOL GENERATOR
J12-B18
52
CB45-2
FIRE CONTROL SYSTEM (NOTE 1)
CPG MRTU
J12-A16
28
CB51-2
AVIONICS CONFIGURATION (NOTE 1)
RADAR WARNING
TB3-16-A
J23-B17
J23-B18
7
5
6
CB74-C2
CB74-A2
CB74-B2
FLIGHT CONTROLS
J27-A11
54
CB18-2
ANTI-COLLISION LIGHTS
J22-A16
44
CB40-2
PILOT EDGE LIGHT PANELS
J22-A7
45
CB39-2
FORMATION LIGHTS
J21-B14
24
CB90-2
A402
PILOT FORWARD CIRCUIT BREAKER PANEL
P3-R
P3-P
P3-N
CB92 MISSION EL AC 5A
P1-30
CB81 MISSION PNVS AC 5A
C1 B1 A1
C2 B2 A2
P2-R
P2-P
P2-N
CB45 MISSION SYM GEN 5A
P1-52
CB42 NAV HARS AC 5A
P1-40
P1-39
P1-38
CB41 MISSION IHADSS 5A
P1-13
P1-12
P1-11
CB43 NAV HSI 5A
P1-26
CB51 MISSION FC AC 5A
P1-28
CB74 MISSION RDR JAM AC 5A
P1-7
P1-6
P1-5
CB84 NAV AIR DATA AC 5A
P2-F
P2-G
P2-H
PILOT CENTER CIRCUIT BREAKER PANEL
CB18 ASE AC 5A
P1-54
CB40 LT ANTI COL 5A
P1-44
CB39 LT PRI 5A
P1-45
CB90 LT FORM 5A
P1-24
A76

SHEET 1 OF 2 MM04/1-757-1A

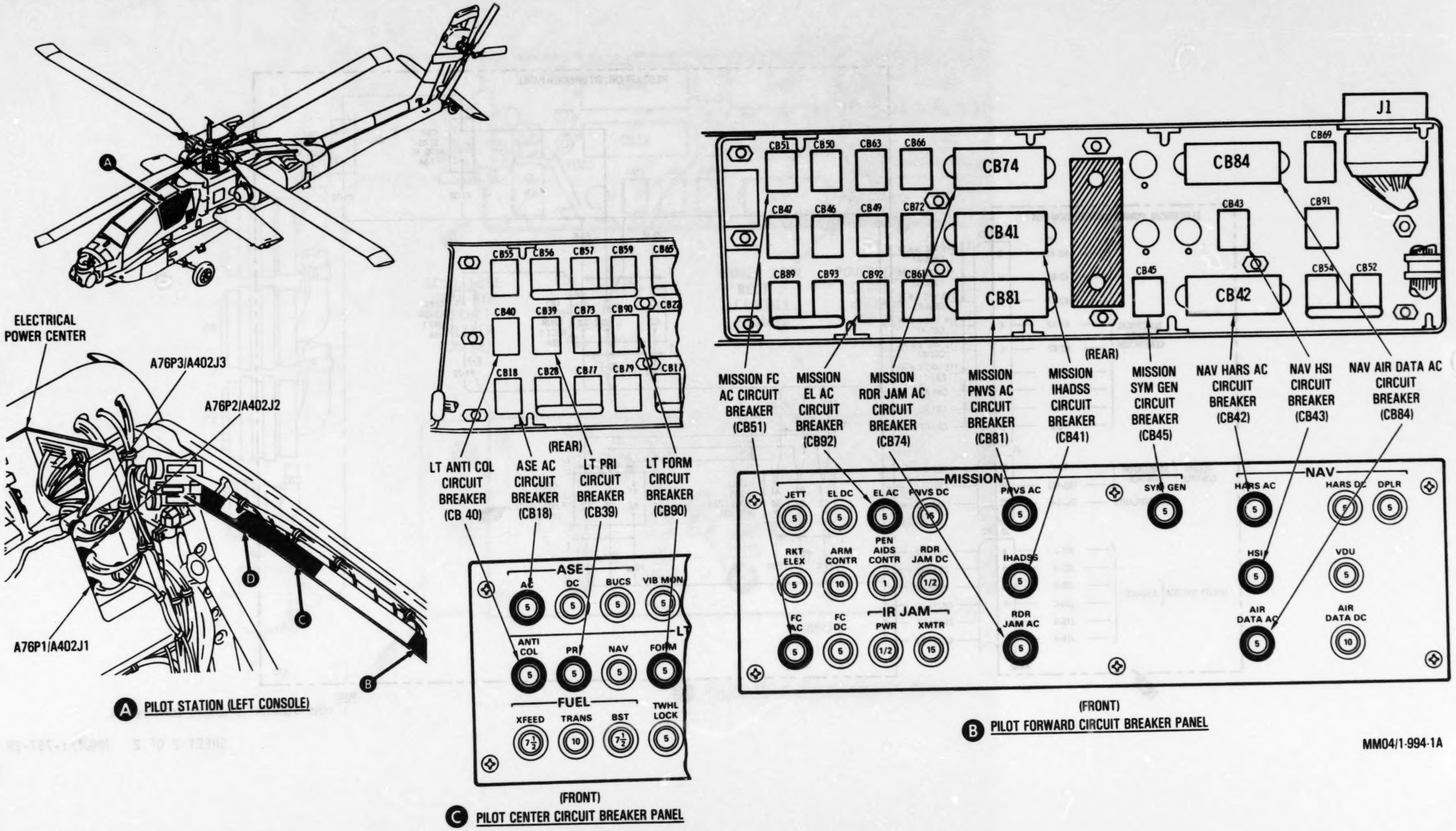
9-16-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - INTERCONNECTION DIAGRAM (cont)


ELECTRICAL POWER DISTRIBUTION BOX
ELECTRICAL POWER GENERATION
K2-A1
K2-B1
K2-C1
K1-A2
K1-B2
K1-C2
P6-F
P6-I
P6-B
J3
P3
G
H
J
K
L
M
S
T
U
T
115 VAC Aϕ IN
CB38-A1
115 VAC Bϕ IN
CB38-B1
115 VAC Cϕ IN
CB38-C1
115 VAC Aϕ IN
CB1-A1
115 VAC Bϕ IN
CB1-B1
115 VAC Cϕ IN
CB1-C1
CB1-A2
CB1-B2
CB1-C2
J1
P1
FLIGHT CONTROL
STABILATOR CONTROL
POWERPLANTS
T3-1
TB3-17J
TB3-14J
37
36
22
CB7-2
CB2-2
CB62-2
J2
P2
UTILITY SYSTEM
ANTI-ICE
J25-J
J25-H
J25-G
J19-C
J19-B
J19-A
p
n
m
s
r
q
CB38-C2
CB38-B2
CB38-A2
CB211-C2
CB211-B2
CB211-A2
A402
PILOT AFT CIRCUIT BREAKER PANEL
CB2 STAB AUTO AC 7.5A
CB7 STAB MAIN AC 1A
1
2
P1-36
P1-37
P3-M
P3-L
P3-K
C1
C2
B1
B2
A1
A2
CB1 POWER XFMR RECT 1 35A
CB62 POWER ENG 1 5A
P3-U
P3-T
P3-S
P1-22
P3-J
P3-H
P3-G
CB38 ECS L NOSE GRBX HTR 20A
CB211 ECS R NOSE GRBX HTR 20A
P2-p
P2-n
P2-m
P2-q
P2-r
P2-s
A76

NOTE:
1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

SHEET 2 OF 2 MM04/1-757-2B

9-16-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
ELECTRICAL POWER CENTER
A76P3/A402J3
A76P2/A402J2
A76P1/A402J1
D
C
B
CB55
CB56
CB57
CB59
CB65
CB40
CB39
CB73
CB90
CB27
CB18
CB28
CB77
CB79
CB17
(REAR)
LT ANTI COL CIRCUIT BREAKER (CB 40)
ASE AC CIRCUIT BREAKER (CB18)
LT PRI CIRCUIT BREAKER (CB39)
LT FORM CIRCUIT BREAKER (CB90)
ASE
AC
DC
BUCS
VIB MON
LT
ANTI COL
PRI
NAV
FORM
FUEL
XFEED
TRANS
BST
TWHL LOCK
5
10
7½
(FRONT)
J1
CB51
CB50
CB63
CB66
CB74
CB84
CB69
CB47
CB46
CB49
CB72
CB41
CB43
CB91
CB89
CB93
CB92
CB61
CB81
CB45
CB42
CB54
CB52
(REAR)
MISSION FC AC CIRCUIT BREAKER (CB51)
MISSION EL AC CIRCUIT BREAKER (CB92)
MISSION RDR JAM AC CIRCUIT BREAKER (CB74)
MISSION PNVS AC CIRCUIT BREAKER (CB81)
MISSION IHADSS CIRCUIT BREAKER (CB41)
MISSION SYM GEN CIRCUIT BREAKER (CB45)
NAV HARS AC CIRCUIT BREAKER (CB42)
NAV HSI CIRCUIT BREAKER (CB43)
NAV AIR DATA AC CIRCUIT BREAKER (CB84)
MISSION
JETT
EL DC
EL AC
PNVS DC
PNVS AC
SYM GEN
RKT ELEX
ARM CONTR
PEN AIDS CONTR
RDR JAM DC
IHADSS
FC AC
FC DC
IR JAM
PWR
XMTR
RDR JAM AC
NAV
HARS AC
HARS DC
DPLR
HSI
VDU
AIR DATA AC
AIR DATA DC
5
10
1
1/2
15
(FRONT)

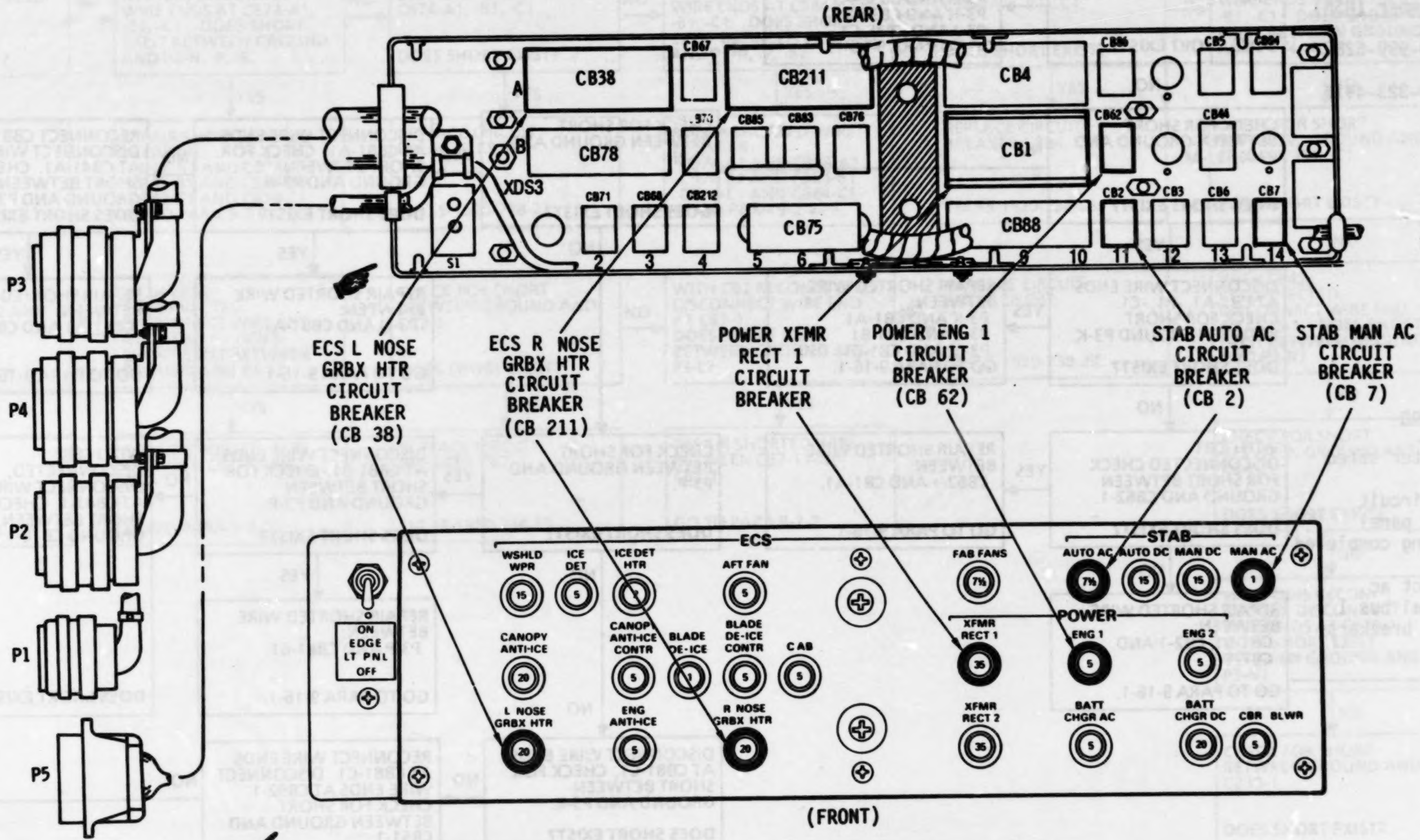
Ⓐ PILOT STATION (LEFT CONSOLE)

Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL

Ⓑ PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-994-1A

9-16-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


(REAR)
CB38
CB67
CB211
CB4
CB86
CB5
CB84
A
B
CB78
S70
CB85
CB83
CB76
CB1
CB62
CB64
XDS3
CB71
CB69
CB212
CB75
CB88
CB2
CB3
CB6
CB7
S1
2
3
4
5
6
8
10
11
12
13
14
P3
P4
P2
P1
P5
ECS L NOSE GRBX HTR CIRCUIT BREAKER (CB 38)
ECS R NOSE GRBX HTR CIRCUIT BREAKER (CB 211)
POWER XFMR RECT 1 CIRCUIT BREAKER
POWER ENG 1 CIRCUIT BREAKER (CB 62)
STAB AUTO AC CIRCUIT BREAKER (CB 2)
STAB MAN AC CIRCUIT BREAKER (CB 7)
ON
EDGE LT PNL
OFF
ECS
WSHLD WPR
15
ICE DET
5
ICE DET HTR
2
AFT FAN
5
CANOPY ANTI-ICE
20
CANOPY ANTI-ICE CONTR
5
BLADE DE-ICE
1
BLADE DE-ICE CONTR
5
C AB
5
L NOSE GRBX HTR
20
ENG ANTI-ICE
5
R NOSE GRBX HTR
20
FAB FANS
7½
STAB
AUTO AC
7½
AUTO DC
15
MAN DC
15
MAN AC
1
POWER
XFMR RECT 1
35
ENG 1
5
ENG 2
5
XFMR RECT 2
35
BATT CHGR AC
5
BATT CHGR DC
20
CBR BLWR
5
(FRONT)

Ⓓ PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-994-2F

9-16-4. A SHORT EXISTS BETWEEN GROUND AND A76P3-G -H, -J; A76P3-K, -L, -M or A76P3-N, -P, -R

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

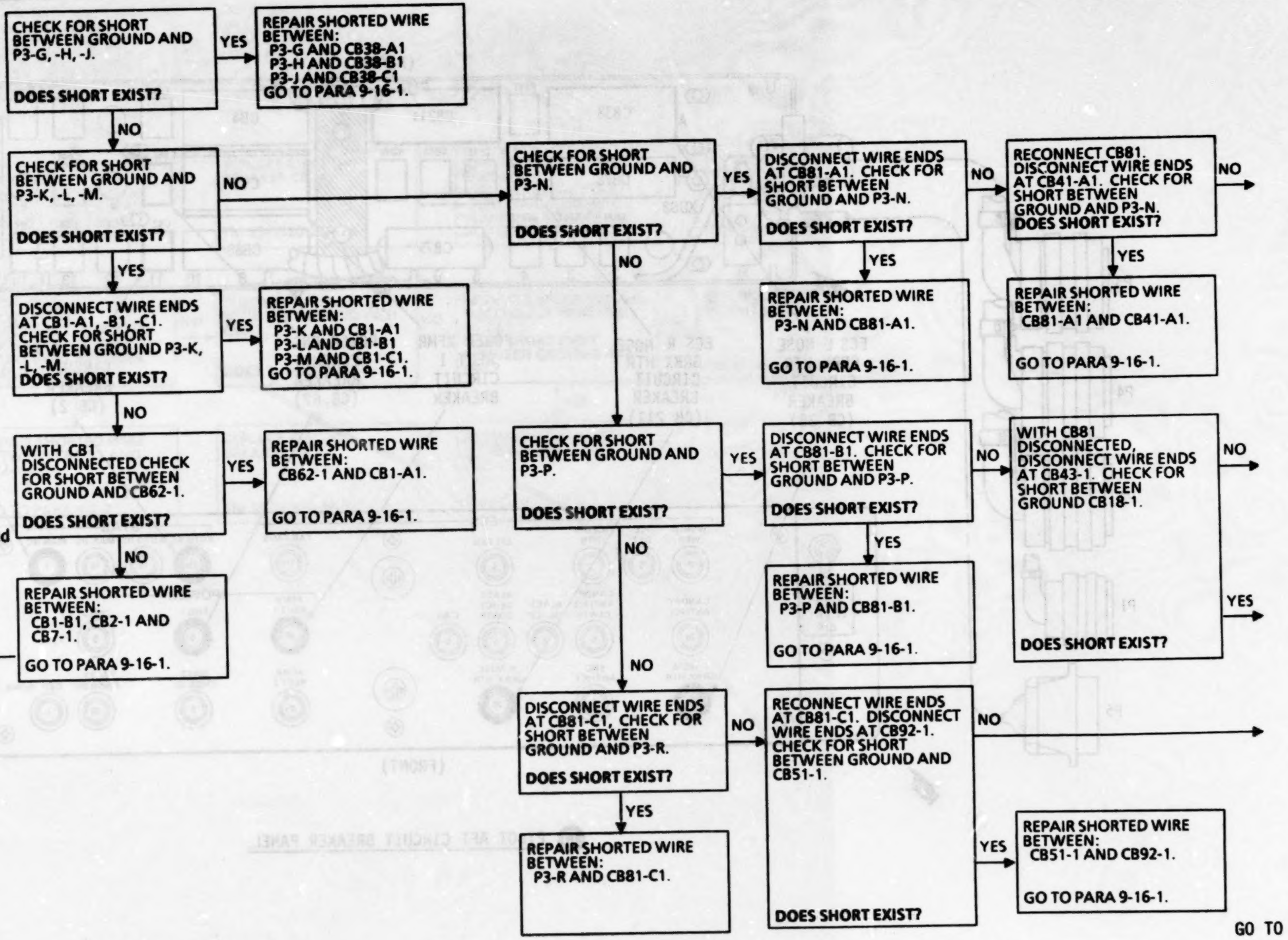
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

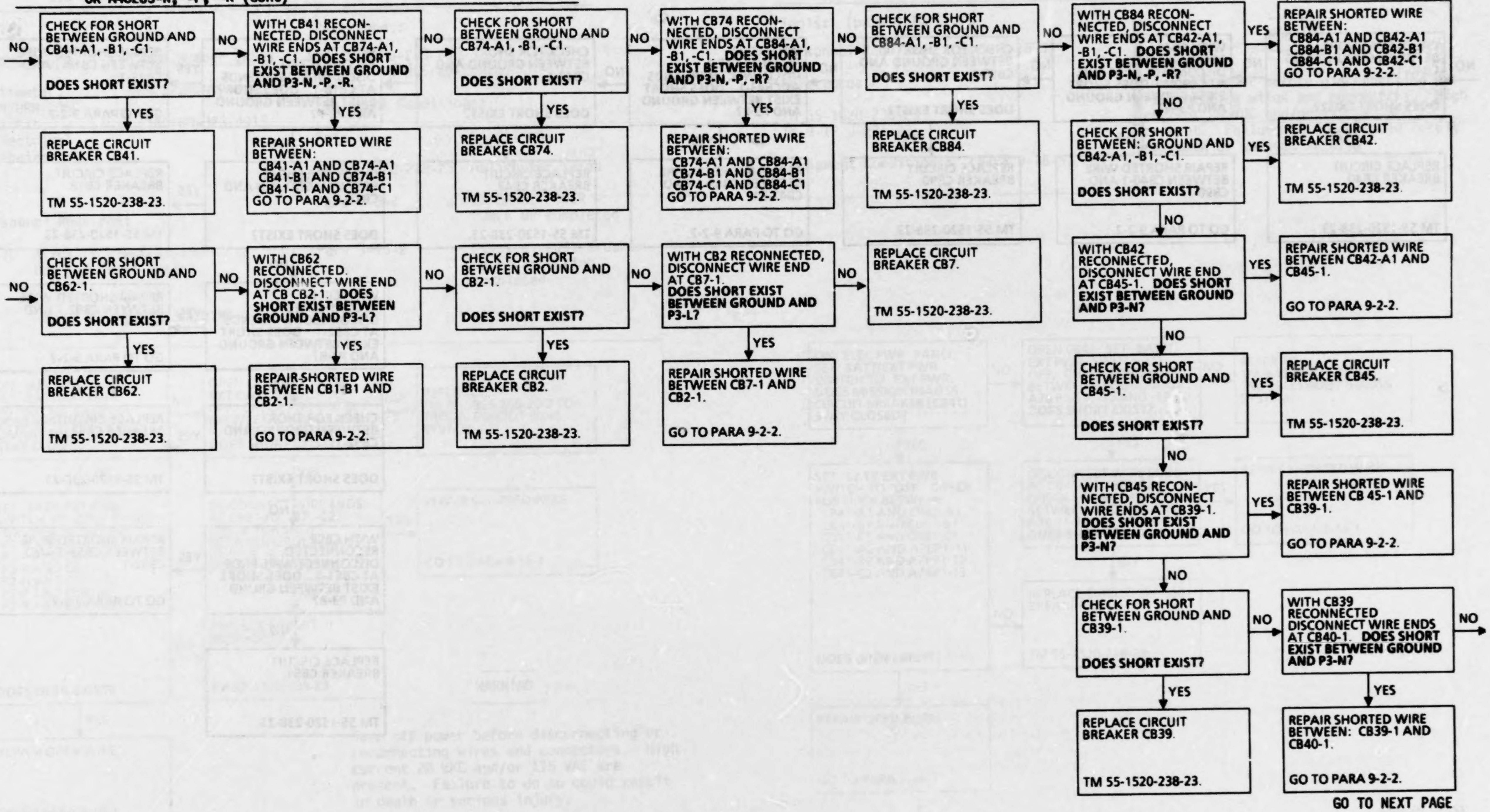
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-16-1	All pilot ac essential bus 1 circuit breakers open


CHECK FOR SHORT BETWEEN GROUND AND P3-G, -H, -J.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN:
P3-G AND CB38-A1
P3-H AND CB38-B1
P3-J AND CB38-C1
GO TO PARA 9-16-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND P3-K, -L, -M.
DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN GROUND AND P3-N.
DOES SHORT EXIST?
YES
DISCONNECT WIRE ENDS AT CB81-A1. CHECK FOR SHORT BETWEEN GROUND AND P3-N.
DOES SHORT EXIST?
NO
RECONNECT CB81. DISCONNECT WIRE ENDS AT CB41-A1. CHECK FOR SHORT BETWEEN GROUND AND P3-N.
DOES SHORT EXIST?
NO
YES
REPAIR SHORTED WIRE BETWEEN:
P3-N AND CB81-A1.
GO TO PARA 9-16-1.
YES
REPAIR SHORTED WIRE BETWEEN:
CB81-A1 AND CB41-A1.
GO TO PARA 9-16-1.
YES
DISCONNECT WIRE ENDS AT CB1-A1, -B1, -C1. CHECK FOR SHORT BETWEEN GROUND P3-K, -L, -M.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN:
P3-K AND CB1-A1
P3-L AND CB1-B1
P3-M AND CB1-C1.
GO TO PARA 9-16-1.
NO
WITH CB1 DISCONNECTED CHECK FOR SHORT BETWEEN GROUND AND CB62-1.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN:
CB62-1 AND CB1-A1.
GO TO PARA 9-16-1.
NO
REPAIR SHORTED WIRE BETWEEN:
CB1-B1, CB2-1 AND CB7-1.
GO TO PARA 9-16-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND P3-P.
DOES SHORT EXIST?
YES
DISCONNECT WIRE ENDS AT CB81-B1. CHECK FOR SHORT BETWEEN GROUND AND P3-P.
DOES SHORT EXIST?
NO
WITH CB81 DISCONNECTED, DISCONNECT WIRE ENDS AT CB43-1. CHECK FOR SHORT BETWEEN GROUND CB18-1.
DOES SHORT EXIST?
NO
YES
YES
REPAIR SHORTED WIRE BETWEEN:
P3-P AND CB81-B1.
GO TO PARA 9-16-1.
NO
NO
DISCONNECT WIRE ENDS AT CB81-C1, CHECK FOR SHORT BETWEEN GROUND AND P3-R.
DOES SHORT EXIST?
NO
RECONNECT WIRE ENDS AT CB81-C1. DISCONNECT WIRE ENDS AT CB92-1. CHECK FOR SHORT BETWEEN GROUND AND CB51-1.
DOES SHORT EXIST?
NO
YES
REPAIR SHORTED WIRE BETWEEN:
CB51-1 AND CB92-1.
GO TO PARA 9-16-1.
YES
REPAIR SHORTED WIRE BETWEEN:
P3-R AND CB81-C1.

GO TO NEXT PAGE

9-16-4. 115 VAC - IS NOT PRESENT AT A402J3-G, -H, -J; A402J3-K, -L, -M; OR A402J3-N, -P, -R (cont)



CHECK FOR SHORT BETWEEN GROUND AND CB41-A1, -B1, -C1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB41. TM 55-1520-238-23.

WITH CB41 RECONNECTED, DISCONNECT WIRE ENDS AT CB74-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND P3-N, -P, -R.

REPAIR SHORTED WIRE BETWEEN:
CB41-A1 AND CB74-A1
CB41-B1 AND CB74-B1
CB41-C1 AND CB74-C1
GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB74-A1, -B1, -C1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB74. TM 55-1520-238-23.

WITH CB74 RECONNECTED, DISCONNECT WIRE ENDS AT CB84-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND P3-N, -P, -R?

REPAIR SHORTED WIRE BETWEEN:
CB74-A1 AND CB84-A1
CB74-B1 AND CB84-B1
CB74-C1 AND CB84-C1
GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB84-A1, -B1, -C1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB84. TM 55-1520-238-23.

WITH CB84 RECONNECTED, DISCONNECT WIRE ENDS AT CB42-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND P3-N, -P, -R?

REPAIR SHORTED WIRE BETWEEN:
CB84-A1 AND CB42-A1
CB84-B1 AND CB42-B1
CB84-C1 AND CB42-C1
GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN: GROUND AND CB42-A1, -B1, -C1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB42. TM 55-1520-238-23.

WITH CB42 RECONNECTED, DISCONNECT WIRE END AT CB45-1. DOES SHORT EXIST BETWEEN GROUND AND P3-N?

REPAIR SHORTED WIRE BETWEEN CB42-A1 AND CB45-1. GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB45-1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB45. TM 55-1520-238-23.

WITH CB45 RECONNECTED, DISCONNECT WIRE ENDS AT CB39-1. DOES SHORT EXIST BETWEEN GROUND AND P3-N?

REPAIR SHORTED WIRE BETWEEN CB 45-1 AND CB39-1. GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB39-1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB39. TM 55-1520-238-23.

WITH CB39 RECONNECTED DISCONNECT WIRE ENDS AT CB40-1. DOES SHORT EXIST BETWEEN GROUND AND P3-N?

REPAIR SHORTED WIRE BETWEEN: CB39-1 AND CB40-1. GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB62-1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB62. TM 55-1520-238-23.

WITH CB62 RECONNECTED. DISCONNECT WIRE END AT CB CB2-1. DOES SHORT EXIST BETWEEN GROUND AND P3-L?

REPAIR-SHORTED WIRE BETWEEN CB1-B1 AND CB2-1. GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB2-1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB2. TM 55-1520-238-23.

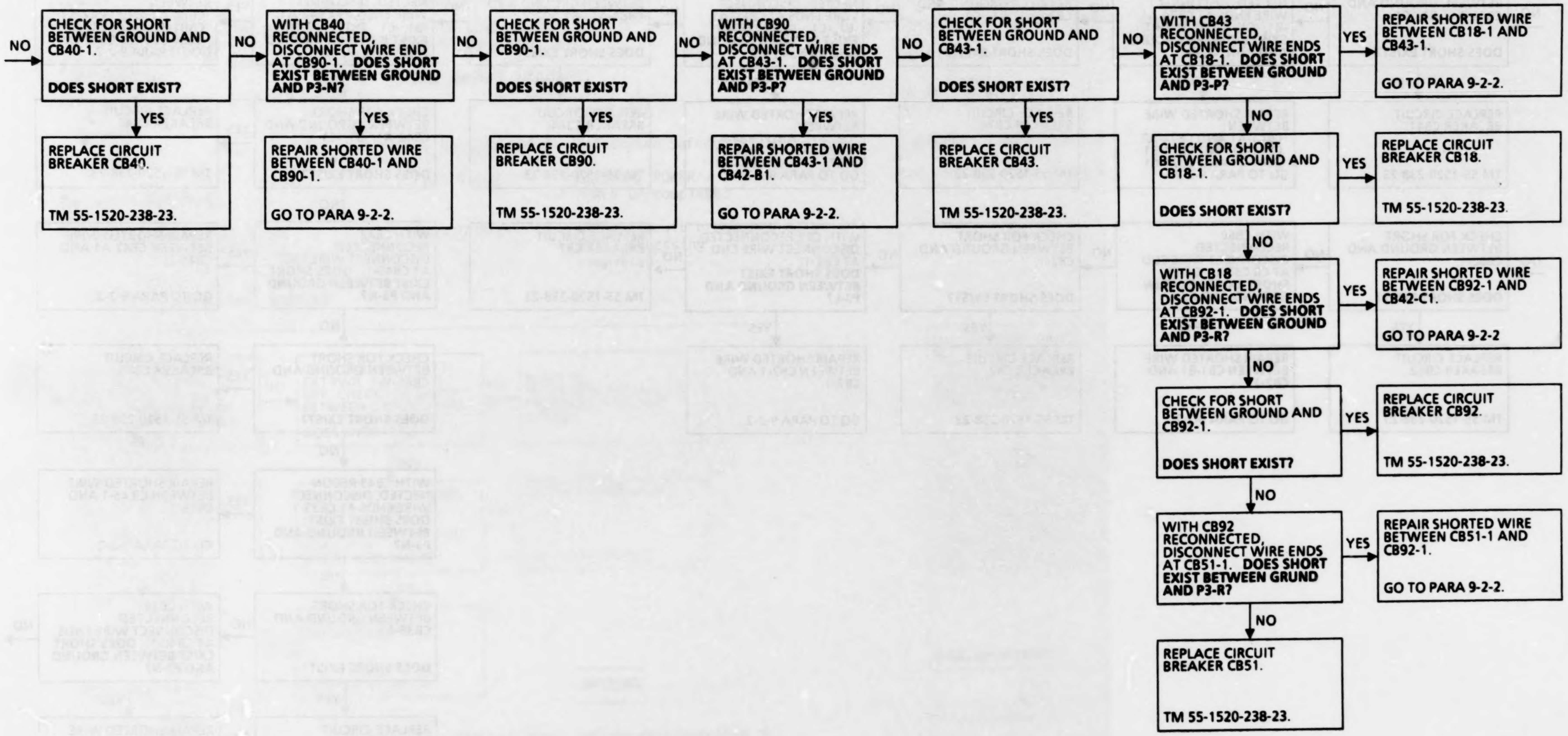
WITH CB2 RECONNECTED, DISCONNECT WIRE END AT CB7-1. DOES SHORT EXIST BETWEEN GROUND AND P3-L?

REPAIR SHORTED WIRE BETWEEN CB7-1 AND CB2-1. GO TO PARA 9-2-2.

REPLACE CIRCUIT BREAKER CB7. TM 55-1520-238-23.

GO TO NEXT PAGE

9-16-4. 115 VAC - IS NOT PRESENT AT A402J3-G, -H, -J; A402J3-K, -L, -M; OR A402J3-N, -P, -R (cont)


NO
CHECK FOR SHORT BETWEEN GROUND AND CB40-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB40. TM 55-1520-238-23.
NO
WITH CB40 RECONNECTED, DISCONNECT WIRE END AT CB90-1. DOES SHORT EXIST BETWEEN GROUND AND P3-N?
YES
REPAIR SHORTED WIRE BETWEEN CB40-1 AND CB90-1. GO TO PARA 9-2-2.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB90-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB90. TM 55-1520-238-23.
NO
WITH CB90 RECONNECTED, DISCONNECT WIRE ENDS AT CB43-1. DOES SHORT EXIST BETWEEN GROUND AND P3-P?
YES
REPAIR SHORTED WIRE BETWEEN CB43-1 AND CB42-B1. GO TO PARA 9-2-2.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB43-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB43. TM 55-1520-238-23.
NO
WITH CB43 RECONNECTED, DISCONNECT WIRE ENDS AT CB18-1. DOES SHORT EXIST BETWEEN GROUND AND P3-P?
YES
REPAIR SHORTED WIRE BETWEEN CB18-1 AND CB43-1. GO TO PARA 9-2-2.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB18-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB18. TM 55-1520-238-23.
NO
WITH CB18 RECONNECTED, DISCONNECT WIRE ENDS AT CB92-1. DOES SHORT EXIST BETWEEN GROUND AND P3-R?
YES
REPAIR SHORTED WIRE BETWEEN CB92-1 AND CB42-C1. GO TO PARA 9-2-2
NO
CHECK FOR SHORT BETWEEN GROUND AND CB92-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB92. TM 55-1520-238-23.
NO
WITH CB92 RECONNECTED, DISCONNECT WIRE ENDS AT CB51-1. DOES SHORT EXIST BETWEEN GRUND AND P3-R?
YES
REPAIR SHORTED WIRE BETWEEN CB51-1 AND CB92-1. GO TO PARA 9-2-2.
NO
REPLACE CIRCUIT BREAKER CB51. TM 55-1520-238-23.

END OF TASK

9-16-5. MISSION PNVS AC CIRCUIT BREAKER (CB81) - DOES NOT STAY CLOSED OR 115 VAC TO PNVS IS NOT PRESENT AT A76P2-N, -P, -R

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

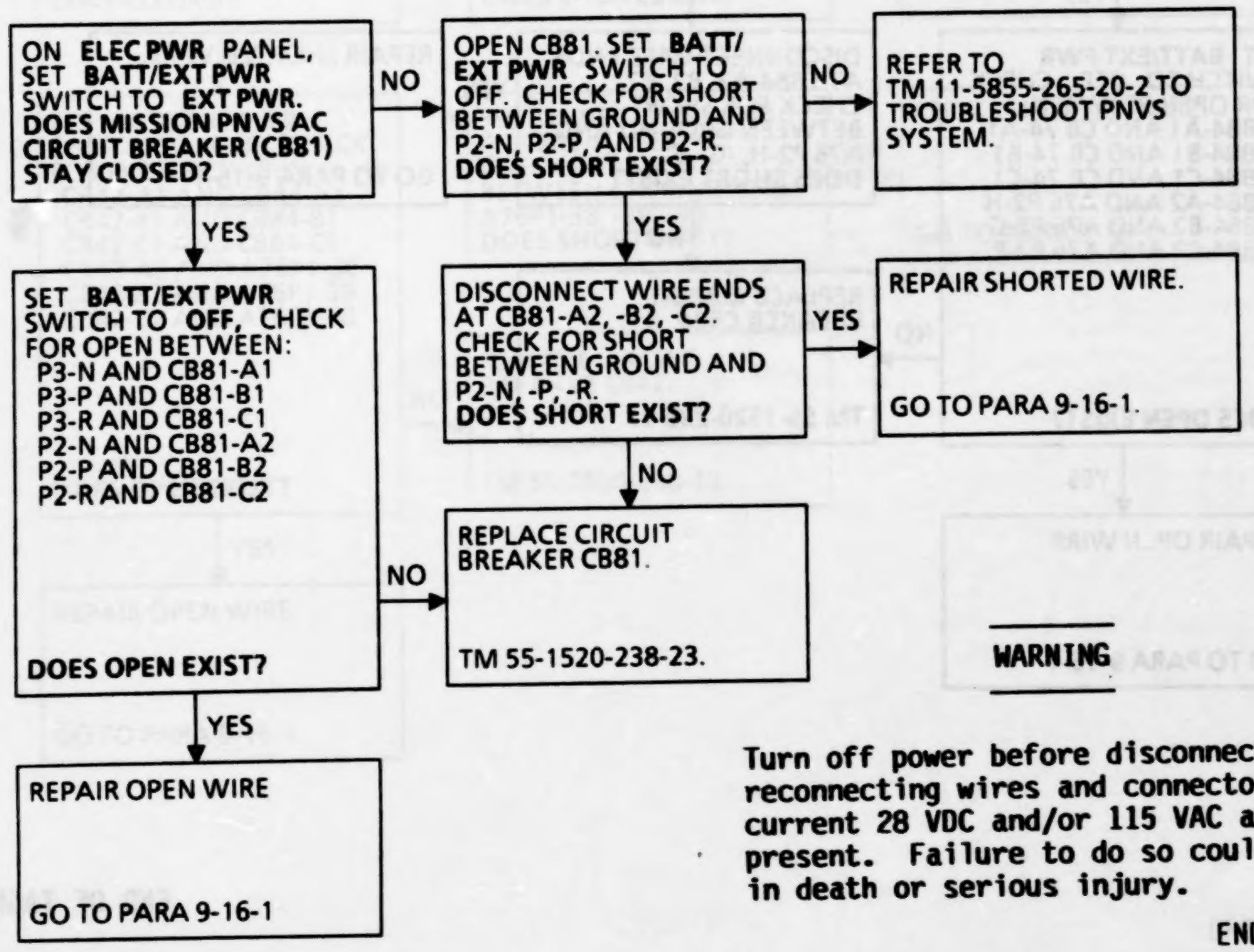
References:

TM 55-1520-238-23
TM 11-5855-265-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION PNVS AC CIRCUIT BREAKER (CB81) STAY CLOSED?
NO
OPEN CB81. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-N, P2-P, AND P2-R. DOES SHORT EXIST?
NO
REFER TO TM 11-5855-265-20-2 TO TROUBLESHOOT PNVS SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: P3-N AND CB81-A1 P3-P AND CB81-B1 P3-R AND CB81-C1 P2-N AND CB81-A2 P2-P AND CB81-B2 P2-R AND CB81-C2 DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB81-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P2-N, -P, -R. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-16-1.
NO
REPLACE CIRCUIT BREAKER CB81. TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE GO TO PARA 9-16-1

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-6. MISSION IHADSS CIRCUIT BREAKER (CB41) - DOES NOT STAY CLOSED OR 115 VAC TO IHADSS IS NOT PRESENT AT A76P1-11, -12, -13

Tools: (para 9-16-5)

Personnel Required: (para 9-16-5)

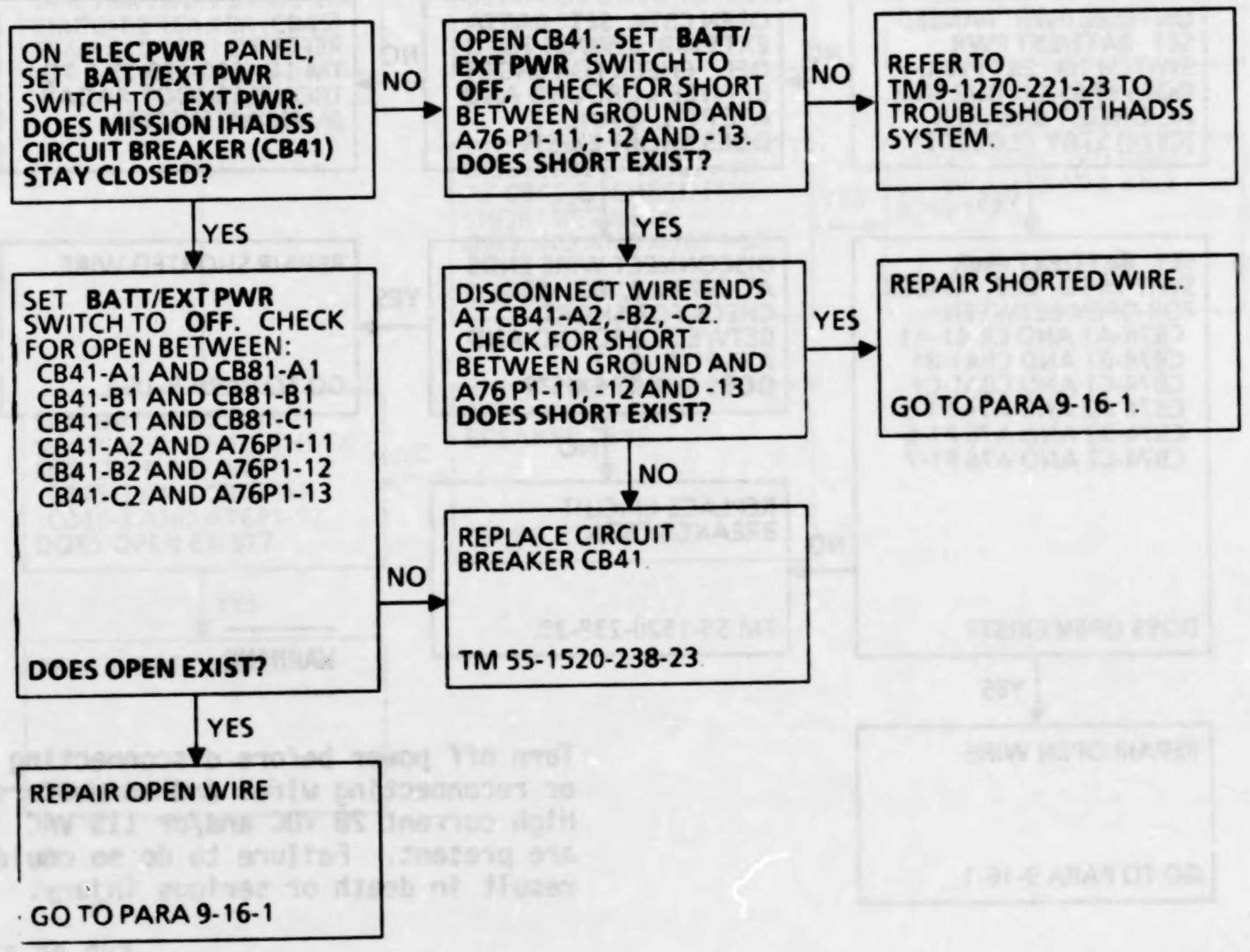
References:

TM 55-1520-238-23
TM 9-1270-221-23

Equipment Conditions: (para 9-16-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION IHADSS CIRCUIT BREAKER (CB41) STAY CLOSED?
NO
OPEN CB41. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76 P1-11, -12 AND -13. DOES SHORT EXIST?
NO
REFER TO TM 9-1270-221-23 TO TROUBLESHOOT IHADSS SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB41-A1 AND CB81-A1 CB41-B1 AND CB81-B1 CB41-C1 AND CB81-C1 CB41-A2 AND A76P1-11 CB41-B2 AND A76P1-12 CB41-C2 AND A76P1-13 DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB41-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76 P1-11, -12 AND -13 DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-16-1.
NO
REPLACE CIRCUIT BREAKER CB41 TM 55-1520-238-23
NO
YES
REPAIR OPEN WIRE GO TO PARA 9-16-1

END OF TASK

9-16-7. MISSION RDR JAM AC CIRCUIT BREAKER (CB74) - DOES NOT STAY CLOSED OR 115 VAC TO RADAR JAMMER IS NOT PRESENT AT A76P1-5, -6, -7

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

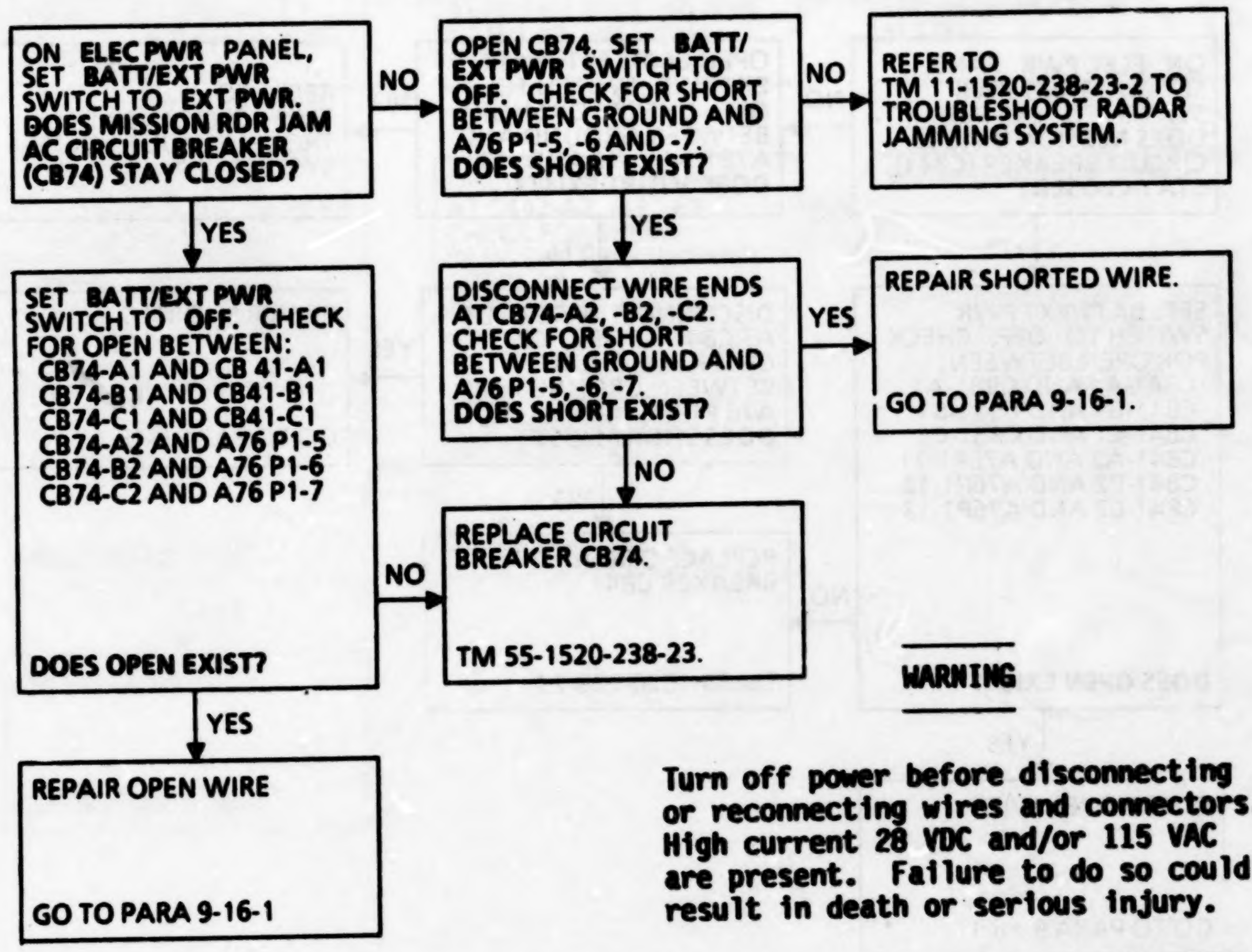
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION RDR JAM AC CIRCUIT BREAKER (CB74) STAY CLOSED?
NO
OPEN CB74. SET BATT/ EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76 P1-5, -6 AND -7. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT RADAR JAMMING SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB74-A1 AND CB 41-A1 CB74-B1 AND CB41-B1 CB74-C1 AND CB41-C1 CB74-A2 AND A76 P1-5 CB74-B2 AND A76 P1-6 CB74-C2 AND A76 P1-7 DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB74-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76 P1-5, -6, -7. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-16-1.
NO
REPLACE CIRCUIT BREAKER CB74. TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE GO TO PARA 9-16-1

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-8. NAV AIR DATA AC CIRCUIT BREAKER (CB84) - DOES NOT STAY CLOSED OR 115 VAC TO OAS IS NOT PRESENT AT A76P2-H, -G, -F

Tools: (para 9-16-7)

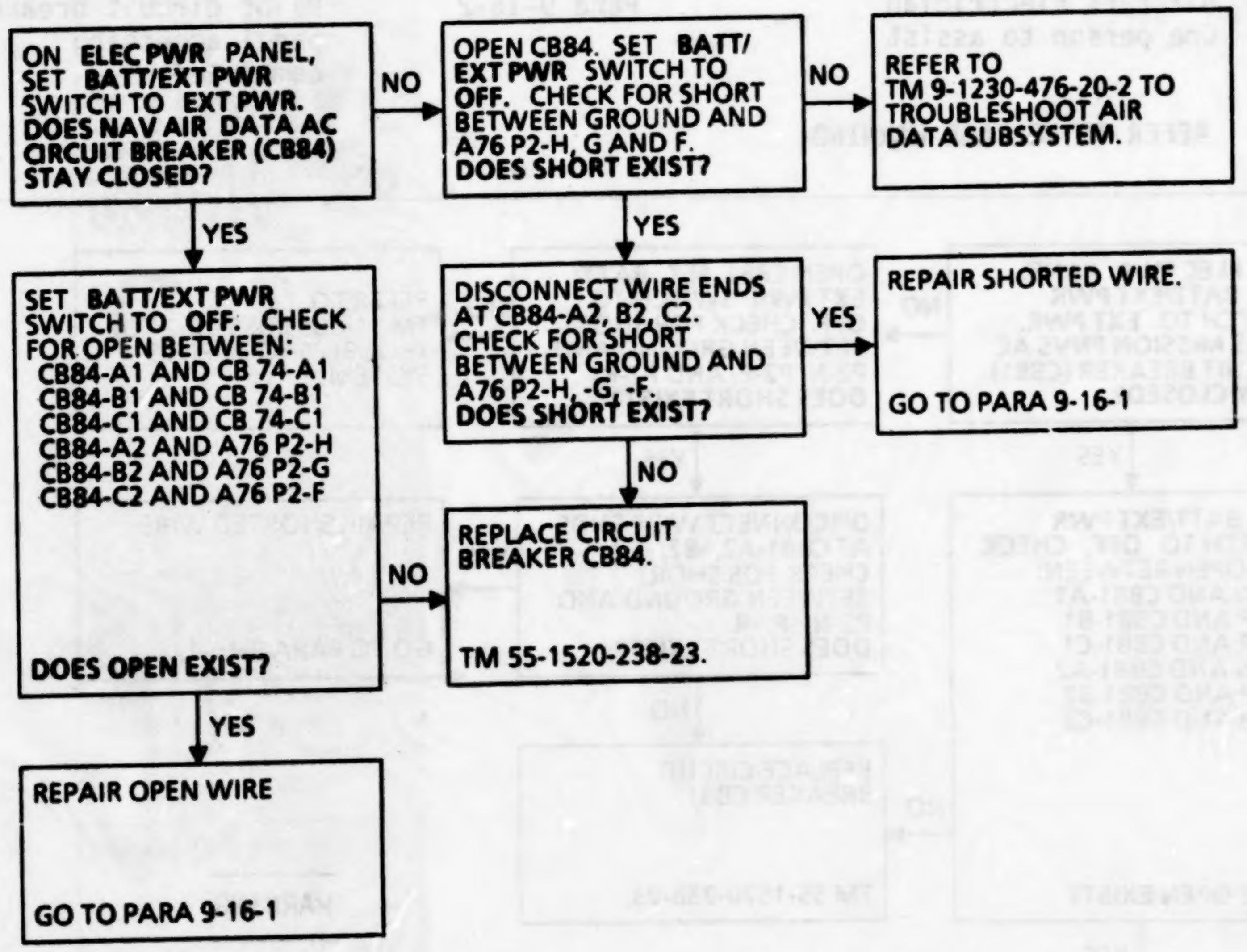
Personnel Required: (para 9-16-7)

References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions: (para 9-16-7)

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV AIR DATA AC CIRCUIT BREAKER (CB84) STAY CLOSED?
NO
OPEN CB84. SET BATT/ EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76 P2-H, G AND F. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT AIR DATA SUBSYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB84-A1 AND CB 74-A1 CB84-B1 AND CB 74-B1 CB84-C1 AND CB 74-C1 CB84-A2 AND A76 P2-H CB84-B2 AND A76 P2-G CB84-C2 AND A76 P2-F DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB84-A2, B2, C2. CHECK FOR SHORT BETWEEN GROUND AND A76 P2-H, -G, -F. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-16-1
NO
REPLACE CIRCUIT BREAKER CB84. TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE GO TO PARA 9-16-1

END OF TASK

9-16-9. NAV HARS AC CIRCUIT BREAKER (CB42) - DOES NOT STAY CLOSED OR 115 VAC TO HARS IS NOT PRESENT AT A76P1-38, -39, -40

Tools: (para 9-16-7)

Personnel Required: (para 9-16-7)

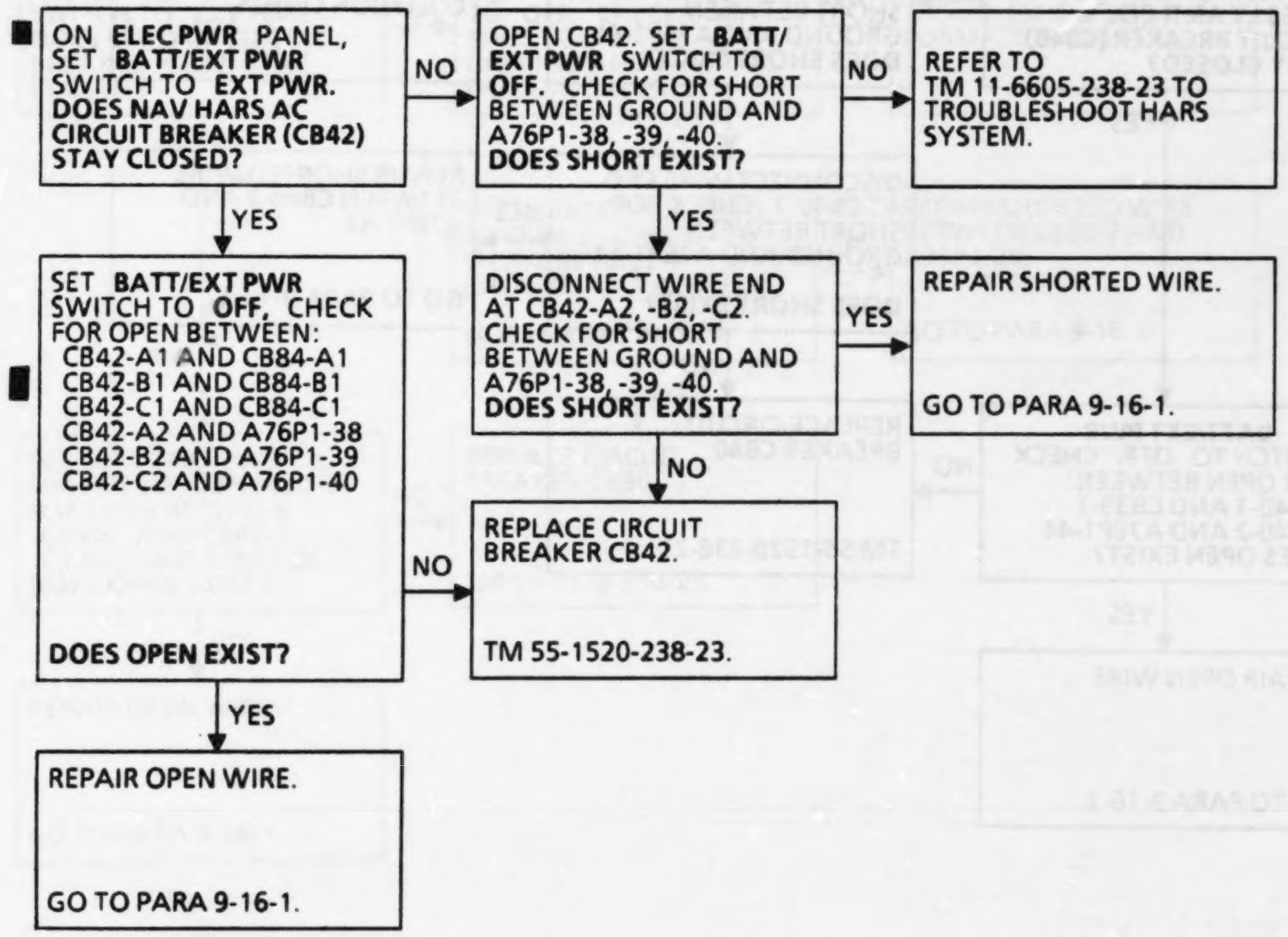
References:

TM 55-1520-238-23
TM 11-6605-238-23

Equipment Conditions: (para 9-16-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV HARS AC CIRCUIT BREAKER (CB42) STAY CLOSED?
NO
OPEN CB42. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-38, -39, -40. DOES SHORT EXIST?
NO
REFER TO TM 11-6605-238-23 TO TROUBLESHOOT HARS SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB42-A1 AND CB84-A1 CB42-B1 AND CB84-B1 CB42-C1 AND CB84-C1 CB42-A2 AND A76P1-38 CB42-B2 AND A76P1-39 CB42-C2 AND A76P1-40 DOES OPEN EXIST?
DISCONNECT WIRE END AT CB42-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-38, -39, -40. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-16-1.
NO
NO
REPLACE CIRCUIT BREAKER CB42. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

END OF TASK

9-16-10. MISSION SYM GEN CIRCUIT BREAKER (CB45) - DOES NOT STAY CLOSED OR 115 VAC TO SYMBOL GENERATOR IS NOT PRESENT AT A76P1-52

Tools: (para 9-16-7)

Personnel Required: (para 9-16-7)

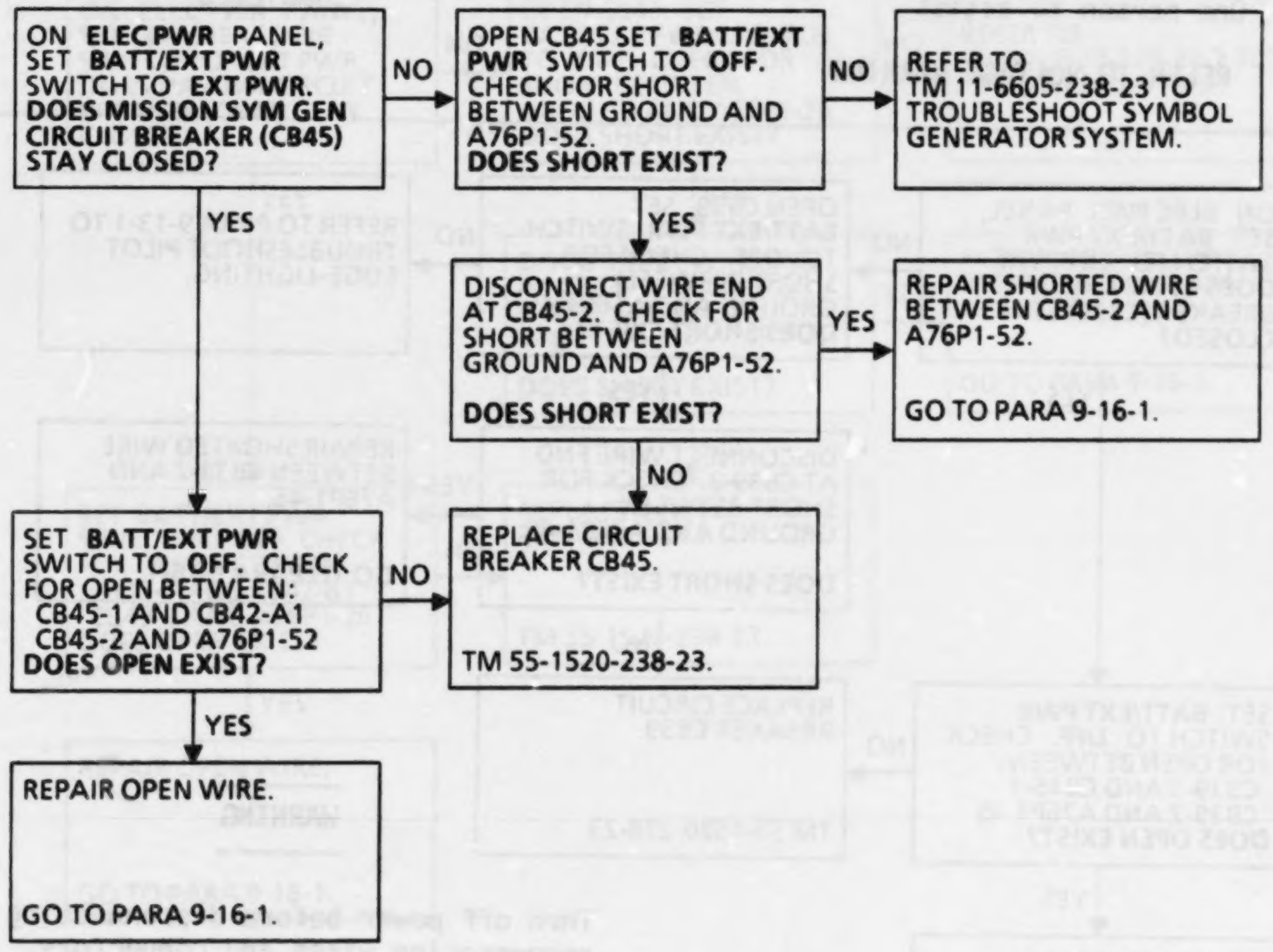
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions: (para 9-16-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION SYM GEN CIRCUIT BREAKER (CB45) STAY CLOSED?
NO
OPEN CB45 SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-52. DOES SHORT EXIST?
NO
REFER TO TM 11-6605-238-23 TO TROUBLESHOOT SYMBOL GENERATOR SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB45-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-52. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB45-2 AND A76P1-52. GO TO PARA 9-16-1.
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB45-1 AND CB42-A1 CB45-2 AND A76P1-52 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB45. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

END OF TASK

9-16-11. LT PRI CIRCUIT BREAKER (CB39) - DOES NOT STAY CLOSED OR 115 VAC TO MULTI-CHANNEL DIMMING CONTROLLER - IS NOT PRESENT AT A76P1-45

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

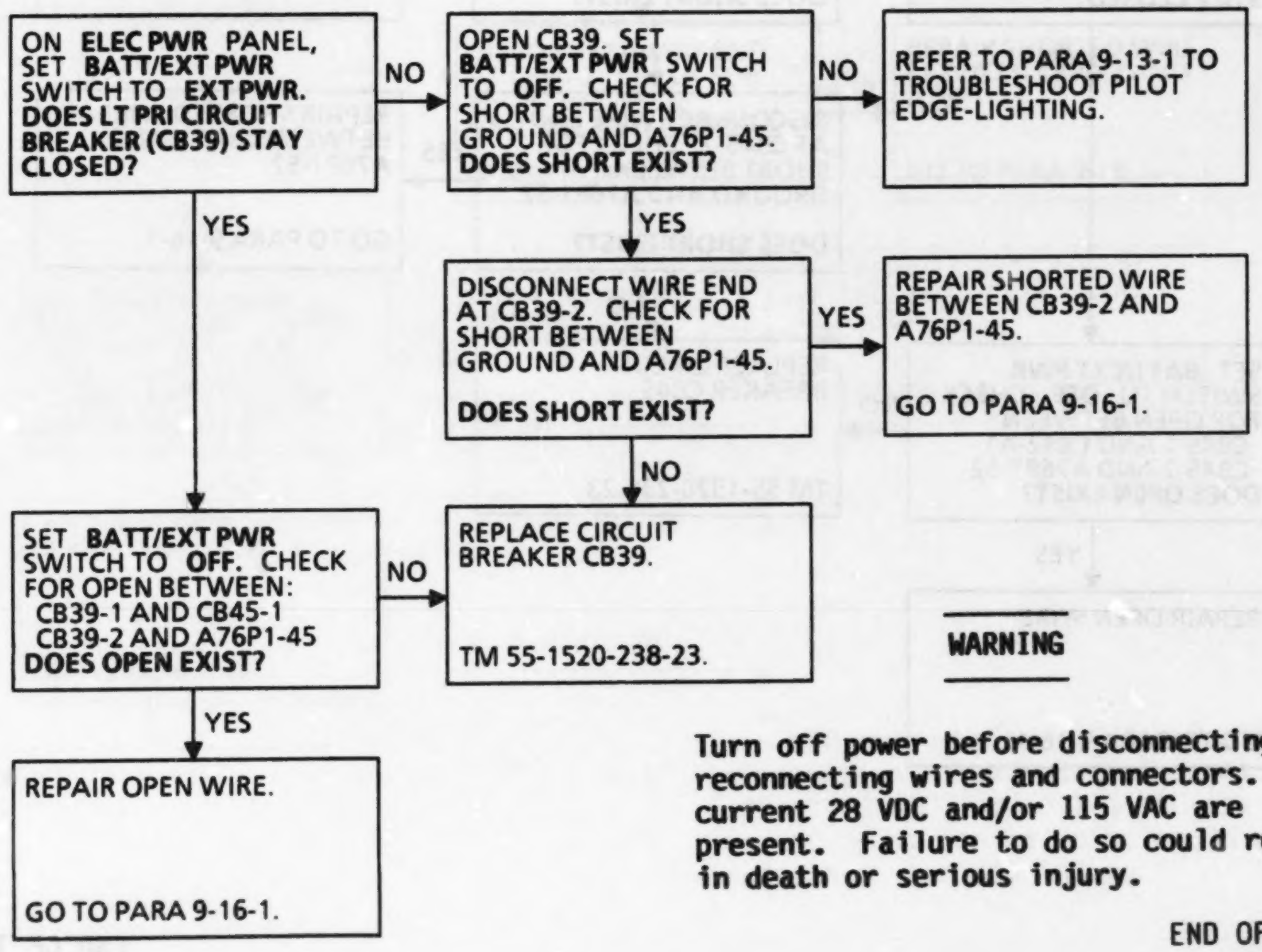
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Condition:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT PRI CIRCUIT BREAKER (CB39) STAY CLOSED?
NO
OPEN CB39. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-45. DOES SHORT EXIST?
NO
REFER TO PARA 9-13-1 TO TROUBLESHOOT PILOT EDGE-LIGHTING.
YES
DISCONNECT WIRE END AT CB39-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-45. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB39-2 AND A76P1-45. GO TO PARA 9-16-1.
NO
REPLACE CIRCUIT BREAKER CB39. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB39-1 AND CB45-1 CB39-2 AND A76P1-45 DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-12. LT ANTI COL CIRCUIT BREAKER (CB40) - DOES NOT STAY CLOSED OR 115 VAC TO ANTI COLLISION LIGHTS IS NOT PRESENT AT A76P1-44

Tools: (para 9-16-11)

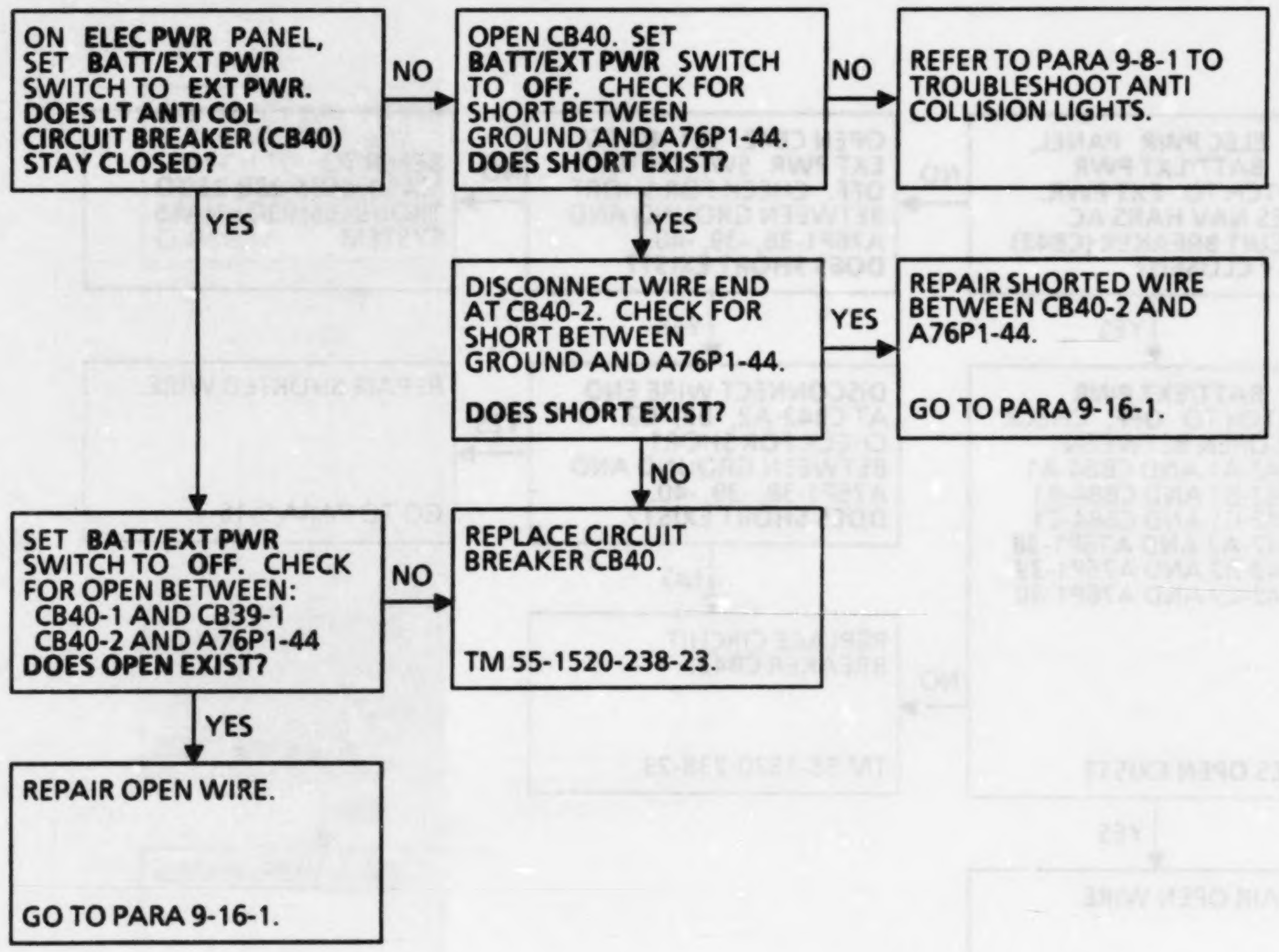
Personnel Required: (para 9-16-11)

References: (para 9-16-11)

Equipment Conditions: (para 9-16-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT ANTI COL CIRCUIT BREAKER (CB40) STAY CLOSED?
NO
OPEN CB40. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-44. DOES SHORT EXIST?
NO
REFER TO PARA 9-8-1 TO TROUBLESHOOT ANTI COLLISION LIGHTS.
YES
DISCONNECT WIRE END AT CB40-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-44. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB40-2 AND A76P1-44. GO TO PARA 9-16-1.
NO
REPLACE CIRCUIT BREAKER CB40. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB40-1 AND CB39-1 CB40-2 AND A76P1-44 DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

END OF TASK

9-16-13. LT FORM CIRCUIT BREAKER (CB90) - DOES NOT STAY CLOSED OR 115 VAC TO FORMATION LIGHTS IS NOT PRESENT AT A76P1-24

Tools: (para 9-16-11)

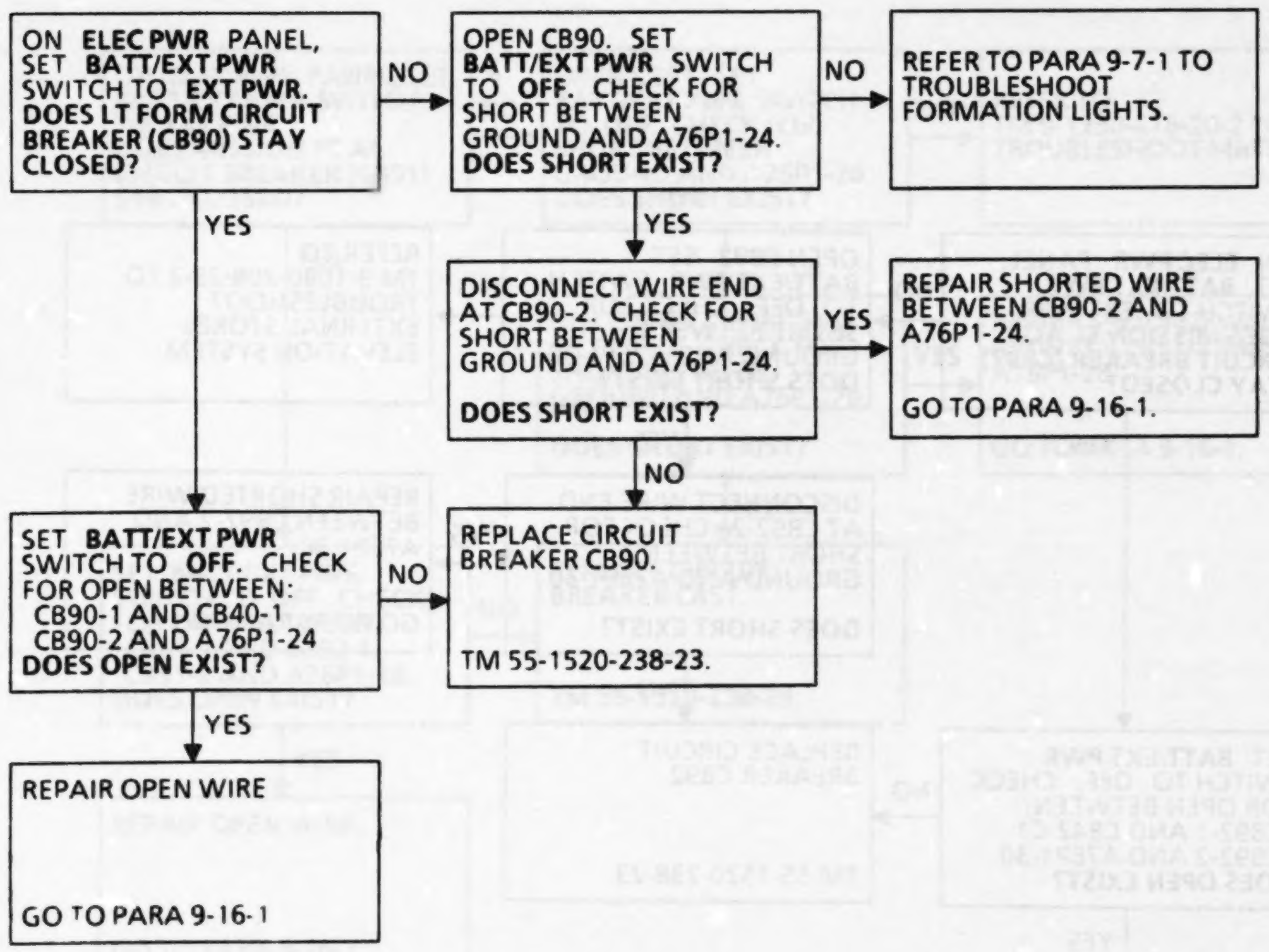
Personnel Required: (para 9-16-11)

References: (para 9-16-11)

Equipment Conditions: (para 9-16-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT FORM CIRCUIT BREAKER (CB90) STAY CLOSED?
NO
OPEN CB90. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-24. DOES SHORT EXIST?
NO
REFER TO PARA 9-7-1 TO TROUBLESHOOT FORMATION LIGHTS.
YES
YES
DISCONNECT WIRE END AT CB90-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-24. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB90-2 AND A76P1-24. GO TO PARA 9-16-1.
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB90-1 AND CB40-1 CB90-2 AND A76P1-24 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB90. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE GO TO PARA 9-16-1

END OF TASK

9-16-14. NAV HSI CIRCUIT BREAKER (CB43) - DOES NOT STAY CLOSED OR 115 VAC TO HORIZONTAL SITUATION INDICATOR IS NOT PRESENT AT A76P1-26

Tools: (para 9-16-11)

Personnel Required: (para 9-16-11)

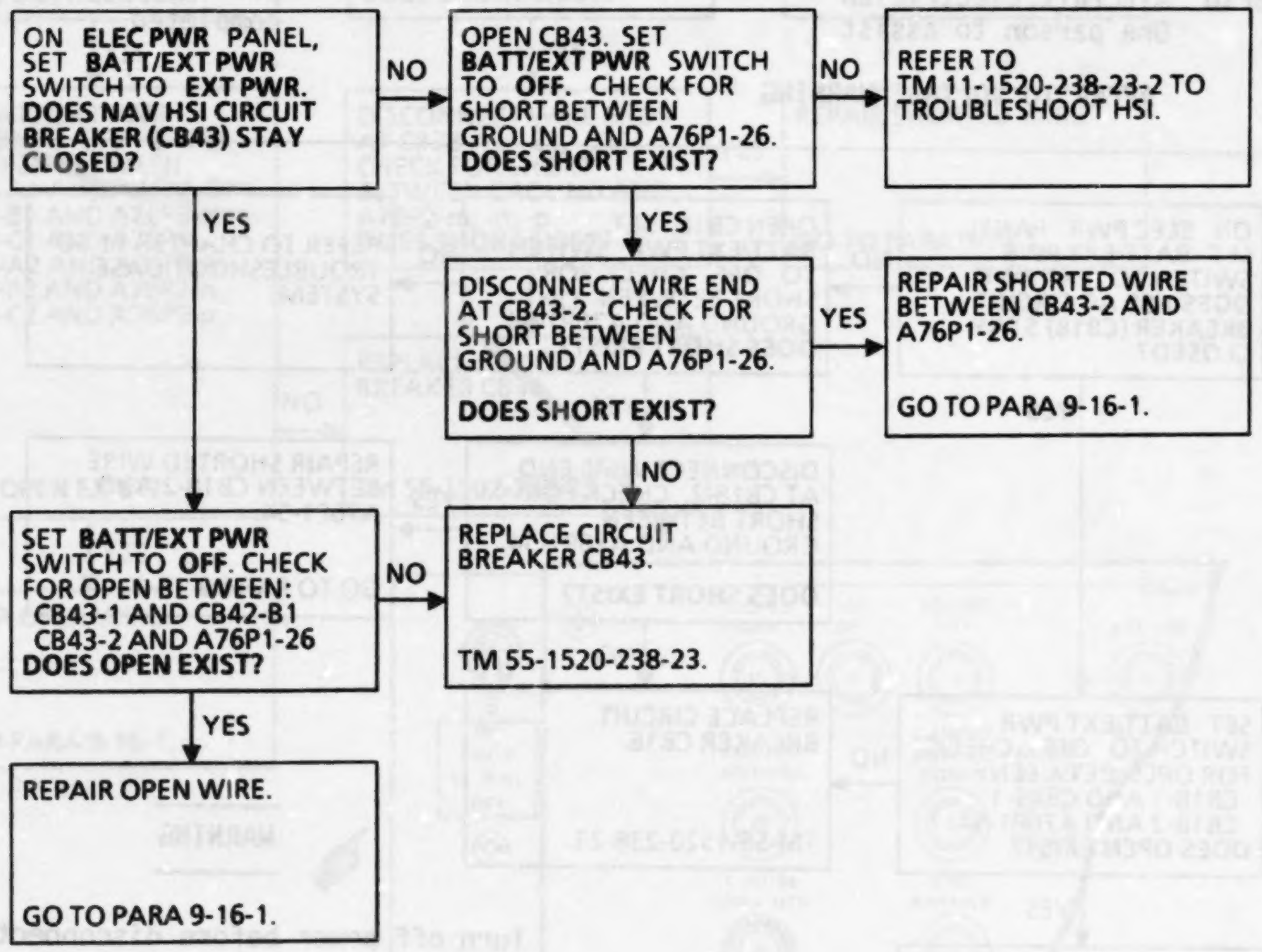
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions: (para 9-16-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV HSI CIRCUIT BREAKER (CB43) STAY CLOSED?
NO
OPEN CB43. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-26. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT HSI.
YES
YES
DISCONNECT WIRE END AT CB43-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-26. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB43-2 AND A76P1-26. GO TO PARA 9-16-1.
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB43-1 AND CB42-B1 CB43-2 AND A76P1-26 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB43. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

END OF TASK

9-16-15. ASE AC CIRCUIT BREAKER (CB18) - DOES NOT STAY CLOSED OR 115 VAC TO ASE ACTUATORS IS NOT PRESENT AT A76P1-54

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

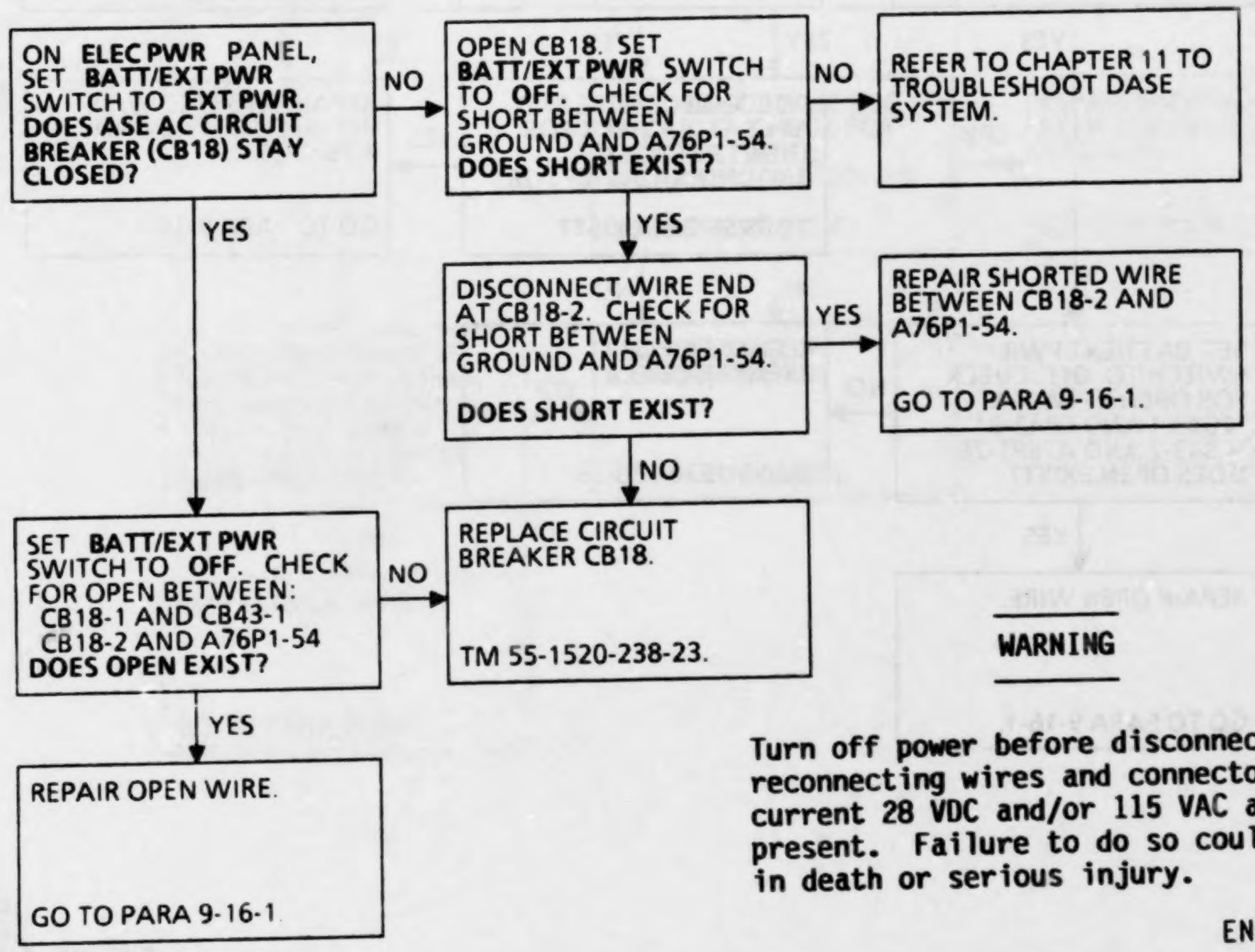
References:

TM 55-1520-238-23

Equipment Condition:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ASE AC CIRCUIT BREAKER (CB18) STAY CLOSED?
NO
OPEN CB18. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-54. DOES SHORT EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT DASE SYSTEM.
YES
DISCONNECT WIRE END AT CB18-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-54. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB18-2 AND A76P1-54. GO TO PARA 9-16-1.
NO
REPLACE CIRCUIT BREAKER CB18. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB18-1 AND CB43-1 CB18-2 AND A76P1-54 DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-16. MISSION EL AC CIRCUIT BREAKER (CB92) - DOES NOT STAY CLOSED OR 115 VAC TO STORES ELEVATION CONTROLLER IS NOT PRESENT AT 76P1-30

Tools: (para 9-16-15)

Personnel Required: (para 9-16-15)

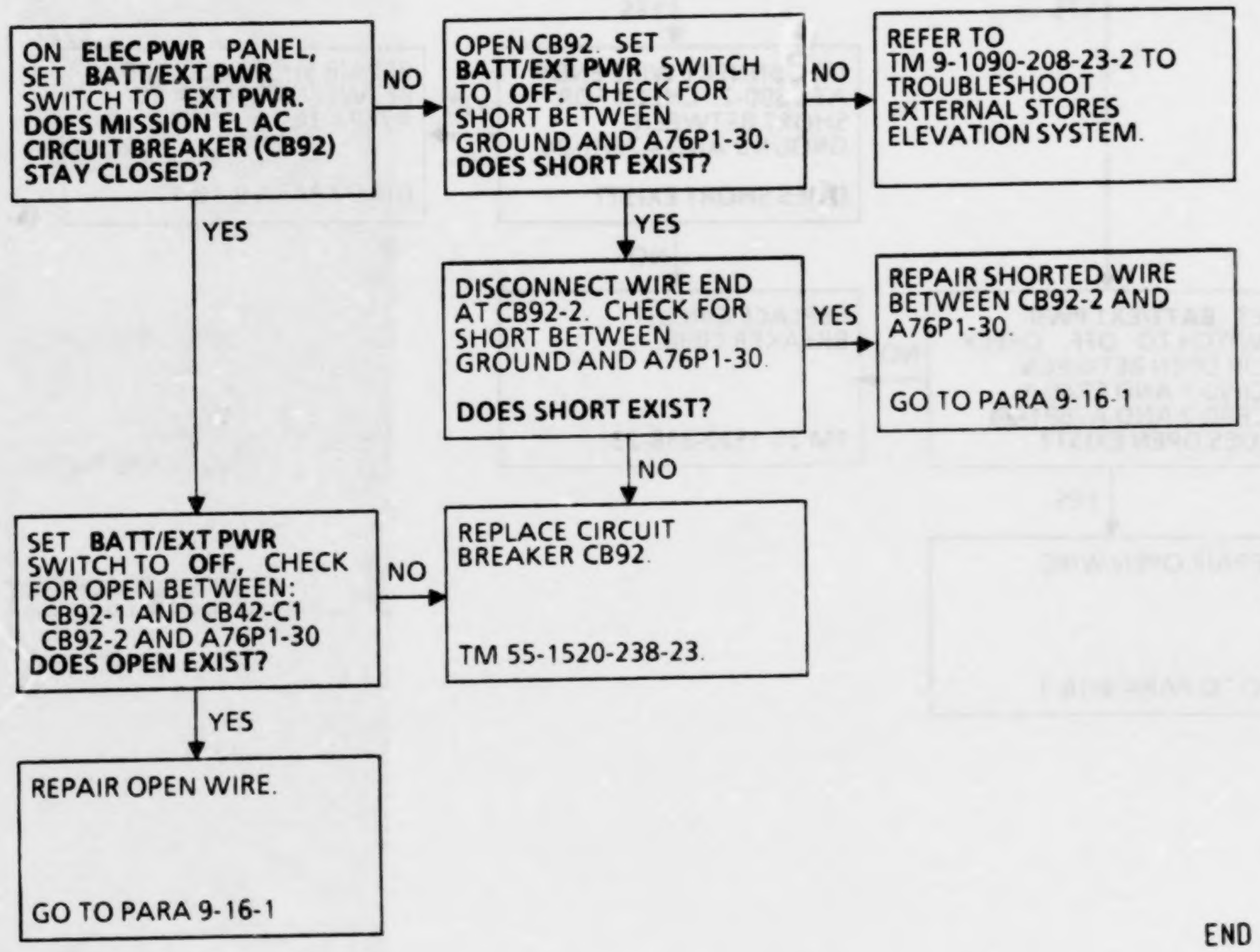
References:

TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions: (para 9-16-15)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION EL AC CIRCUIT BREAKER (CB92) STAY CLOSED?
NO
OPEN CB92. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-30. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT EXTERNAL STORES ELEVATION SYSTEM.
YES
DISCONNECT WIRE END AT CB92-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-30. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB92-2 AND A76P1-30. GO TO PARA 9-16-1
NO
REPLACE CIRCUIT BREAKER CB92. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB92-1 AND CB42-C1 CB92-2 AND A76P1-30 DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1

END OF TA

9-16-17. MISSION FC AC CIRCUIT BREAKER (CB51) - DOES NOT STAY CLOSED OR 115 VAC IS NOT PRESENT AT A76P1-28

Tools: (para 9-16-15)

Personnel Required: (para 9-16-15)

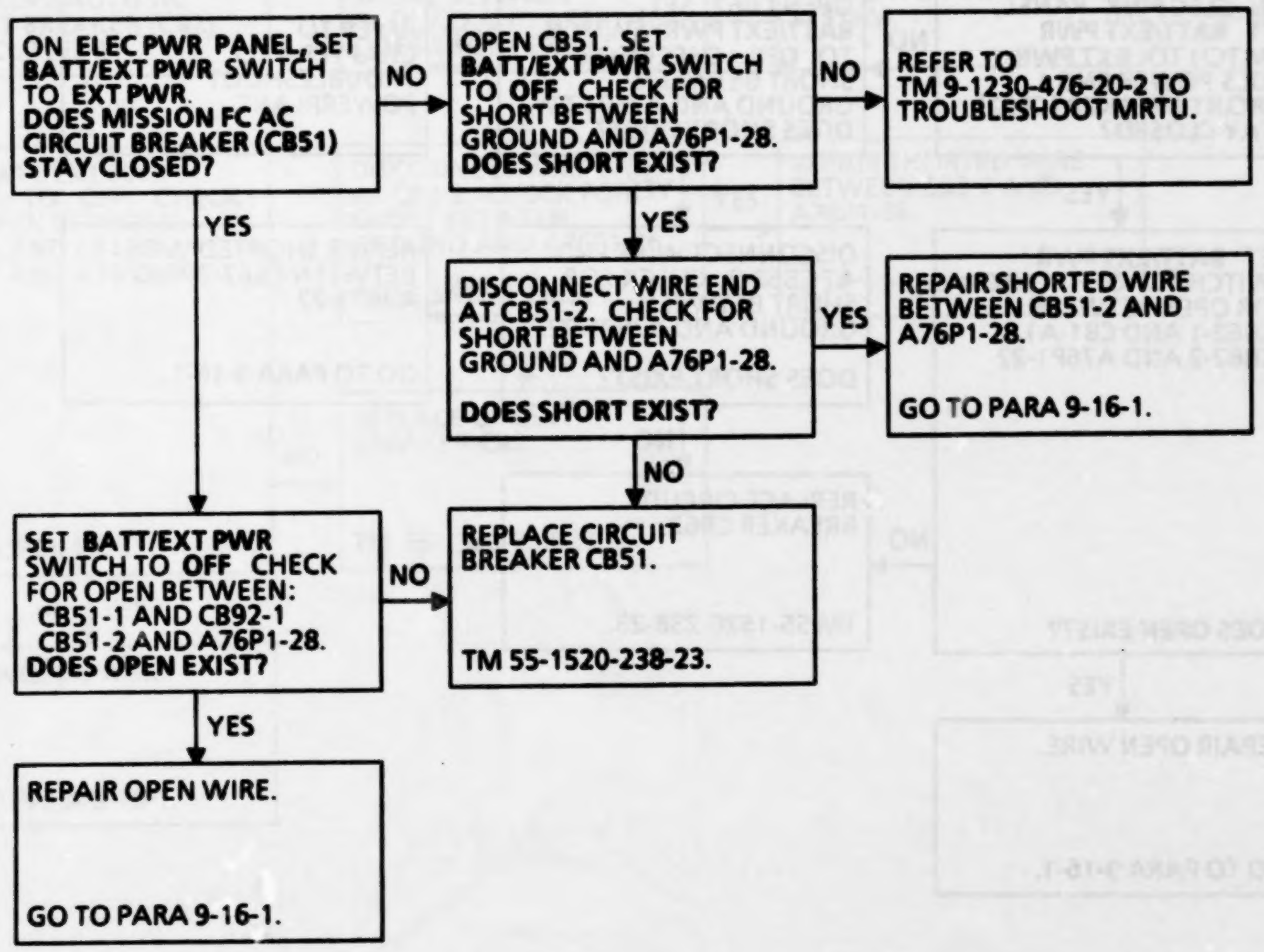
References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions: (para 9-16-15)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION FC AC CIRCUIT BREAKER (CB51) STAY CLOSED?
NO
OPEN CB51. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-28. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.
YES
DISCONNECT WIRE END AT CB51-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-28. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB51-2 AND A76P1-28. GO TO PARA 9-16-1.
NO
REPLACE CIRCUIT BREAKER CB51. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB51-1 AND CB92-1 CB51-2 AND A76P1-28. DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

END OF TASK

9-16-18. ECS L NOSE GRBX HTR CIRCUIT BREAKER (CB38) - DOES NOT STAY CLOSED OR 115 VAC IS NOT PRESENT AT A76P2-m, -n, -p

Tools: (para 9-16-15)

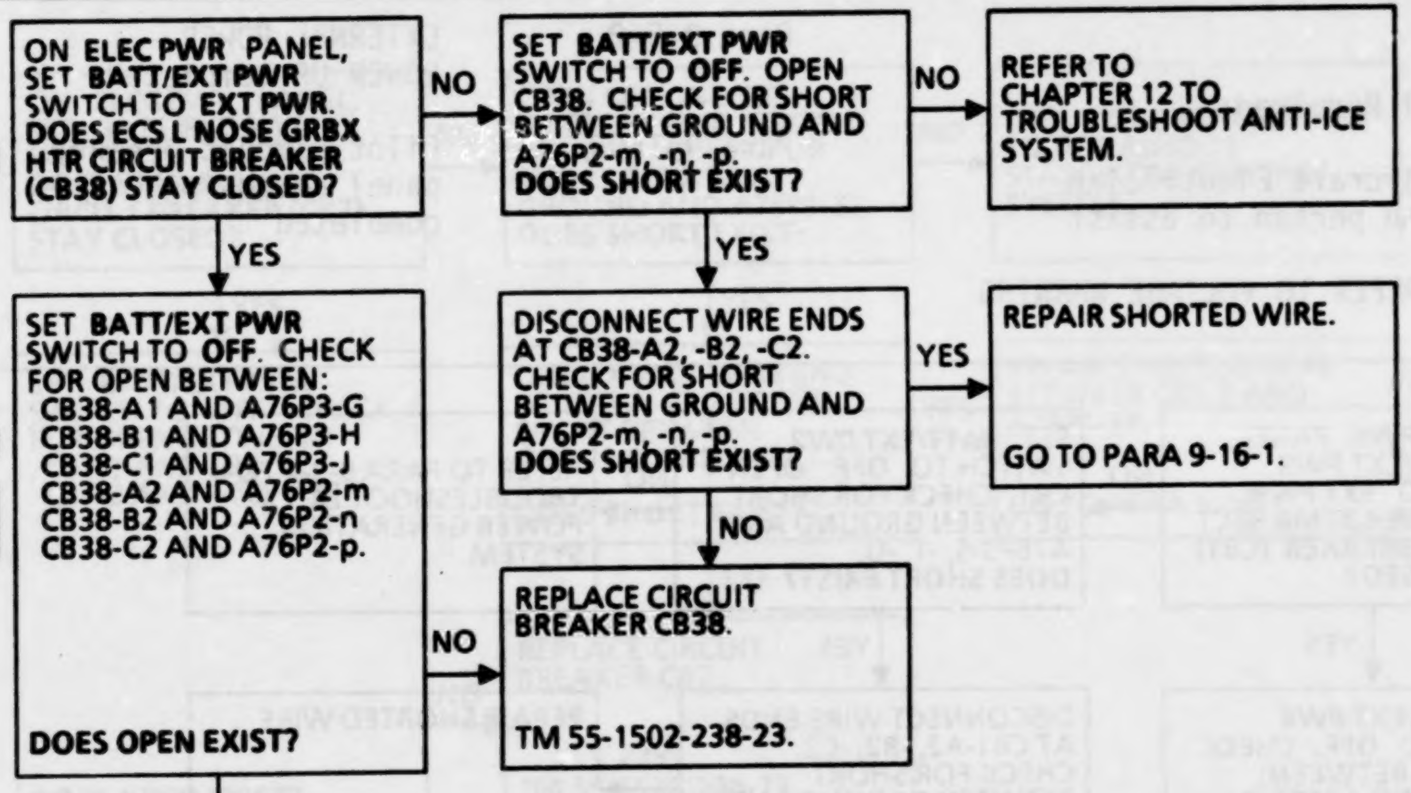
Personnel Required: (para 9-16-15)

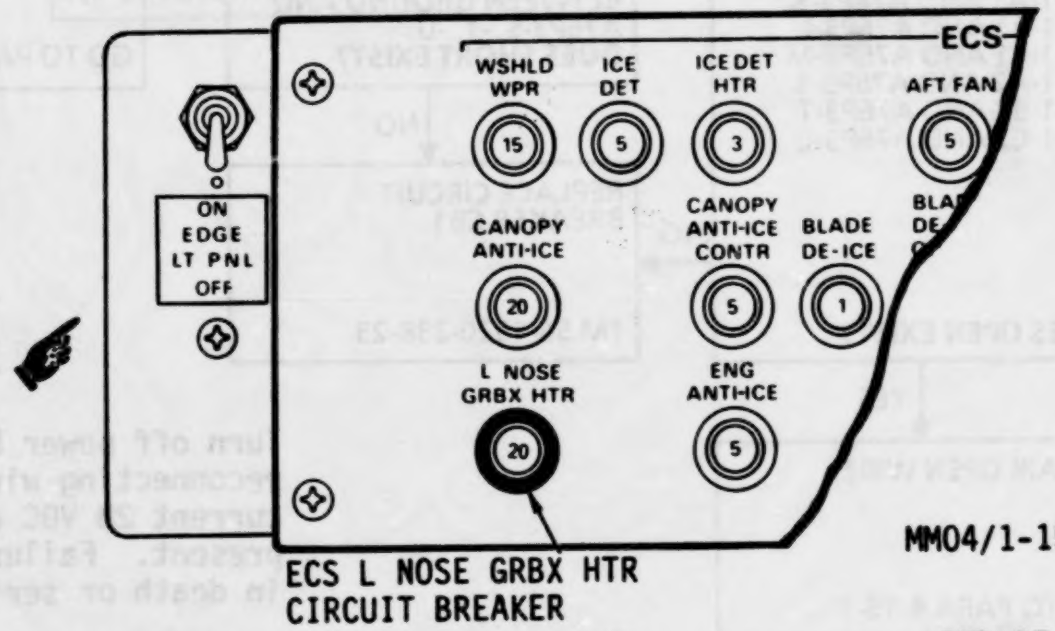
References: (para 9-16-15)

Equipment Conditions: (para 9-16-15)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS L NOSE GRBX HTR CIRCUIT BREAKER (CB38) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. OPEN CB38. CHECK FOR SHORT BETWEEN GROUND AND A76P2-m, -n, -p. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI-ICE SYSTEM.
YES
DISCONNECT WIRE ENDS AT CB38-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-m, -n, -p. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-16-1.
NO
REPLACE CIRCUIT BREAKER CB38. TM 55-1502-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB38-A1 AND A76P3-G CB38-B1 AND A76P3-H CB38-C1 AND A76P3-J CB38-A2 AND A76P2-m CB38-B2 AND A76P2-n CB38-C2 AND A76P2-p. DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.


ECS
WSHLD WPR
15
ICE DET
5
ICE DET HTR
3
AFT FAN
5
BLA DE
ON
EDGE LT PNL
OFF
CANOPY ANTI-ICE
20
CANOPY ANTI-ICE CONTR
5
BLADE DE-ICE
1
L NOSE GRBX HTR
20
ENG ANTI-ICE
5
ECS L NOSE GRBX HTR CIRCUIT BREAKER

MM04/1-1567B

PILOT AFT CIRCUIT BREAKER PANEL

END OF TASK

9-16-19. POWER XFMR RECT 1 CIRCUIT BREAKER (CB1) - DOES NOT STAY CLOSED OR CONTINUITY TO TRANSFORMER RECTIFIER NO. 1 DOES NOT EXIST BETWEEN A76P3-K AND -S; -L AND -T; -M AND -U

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

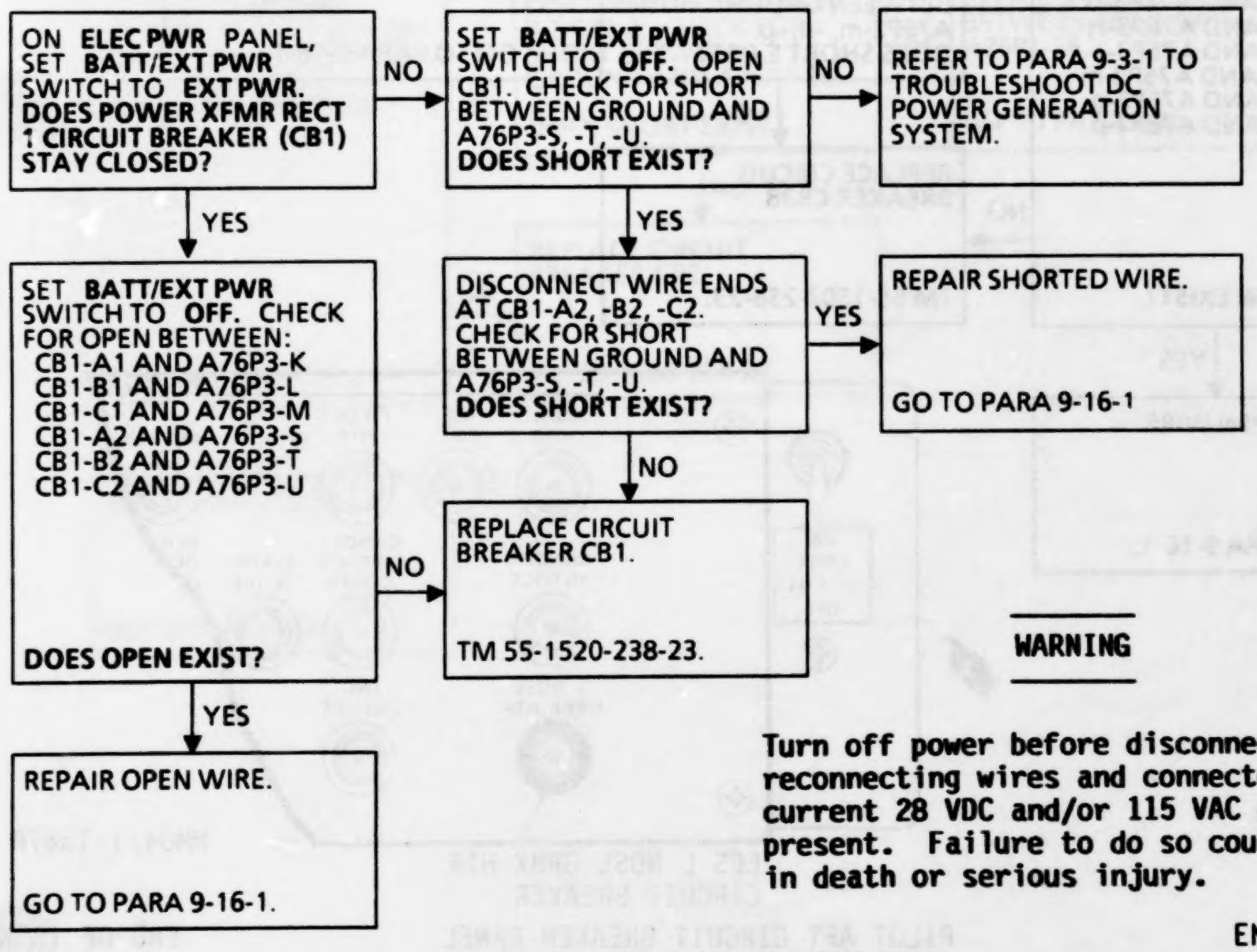
References:

TM 55-1520-238-23

Equipment Condition:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES POWER XFMR RECT 1 CIRCUIT BREAKER (CB1) STAY CLOSED?

SET BATT/EXT PWR SWITCH TO OFF. OPEN CB1. CHECK FOR SHORT BETWEEN GROUND AND A76P3-S, -T, -U. DOES SHORT EXIST?

REFER TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION SYSTEM.

SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB1-A1 AND A76P3-K
CB1-B1 AND A76P3-L
CB1-C1 AND A76P3-M
CB1-A2 AND A76P3-S
CB1-B2 AND A76P3-T
CB1-C2 AND A76P3-U
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB1-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76P3-S, -T, -U. DOES SHORT EXIST?

REPAIR SHORTED WIRE. GO TO PARA 9-16-1

REPLACE CIRCUIT BREAKER CB1. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-16-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-20. POWER ENG 1 CIRCUIT BREAKER (CB62) - DOES NOT STAY CLOSED OR 115 VAC TO ENGINE 1 POWER TRNASFORMER IS NOT PRESENT AT 76P1-22

Tools: (para 9-16-19)

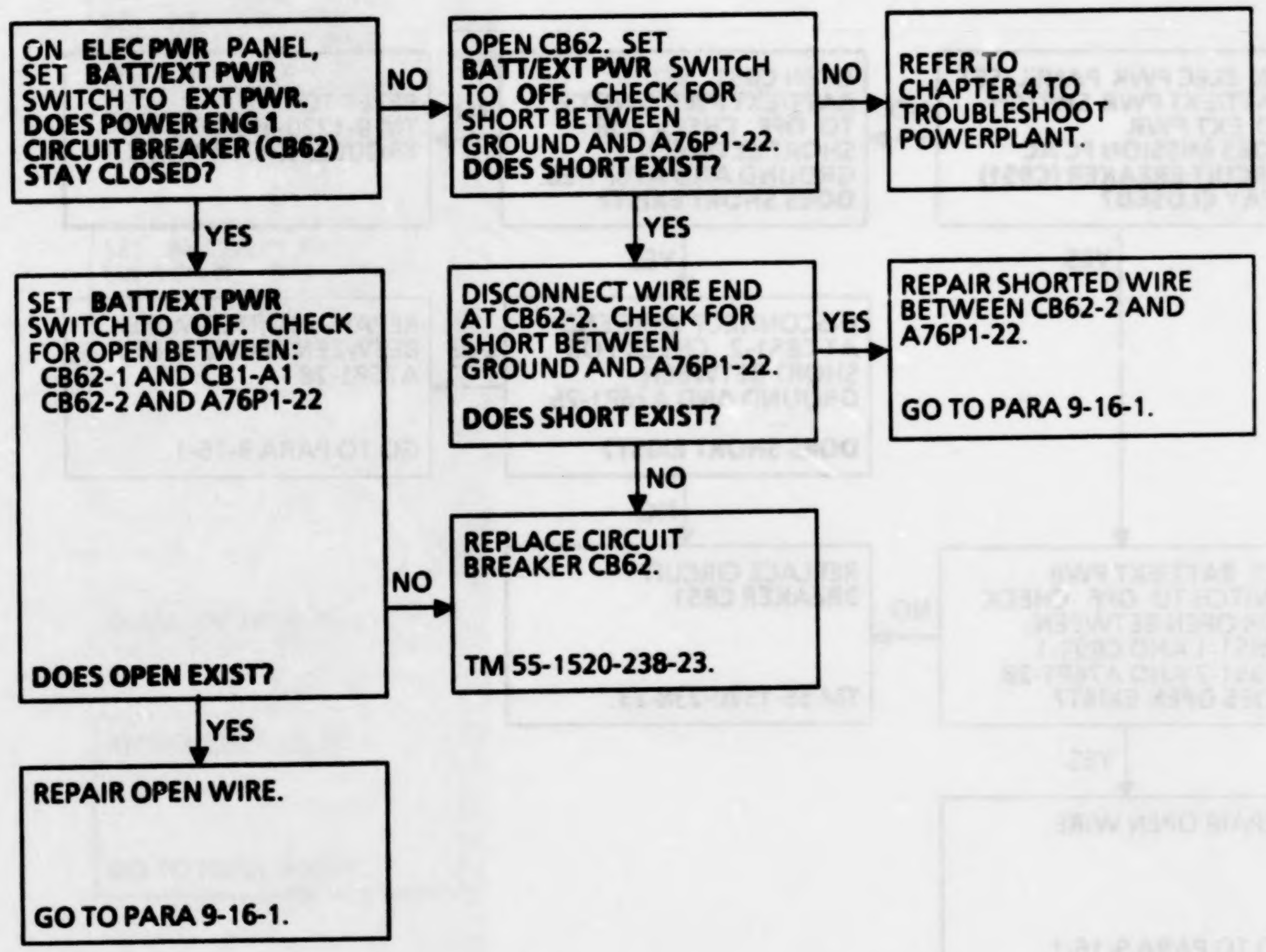
Personnel Required: (para 9-16-19)

References: (para 9-16-19)

Equipment Conditions: (para 9-16-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES POWER ENG 1 CIRCUIT BREAKER (CB62) STAY CLOSED?

OPEN CB62. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-22. DOES SHORT EXIST?

REFER TO CHAPTER 4 TO TROUBLESHOOT POWERPLANT.

SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB62-1 AND CB1-A1
CB62-2 AND A76P1-22
DOES OPEN EXIST?

DISCONNECT WIRE END AT CB62-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-22. DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB62-2 AND A76P1-22. GO TO PARA 9-16-1.

REPLACE CIRCUIT BREAKER CB62. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-16-1.

END OF TASK

9-16-21. STAB MAN AC CIRCUIT BREAKER (CB7) - DOES NOT STAY CLOSED OR 115 VAC TO STABILATOR CONTROL UNIT IS NOT PRESENT AT P76P1-36

Tools: (para 9-16-19)

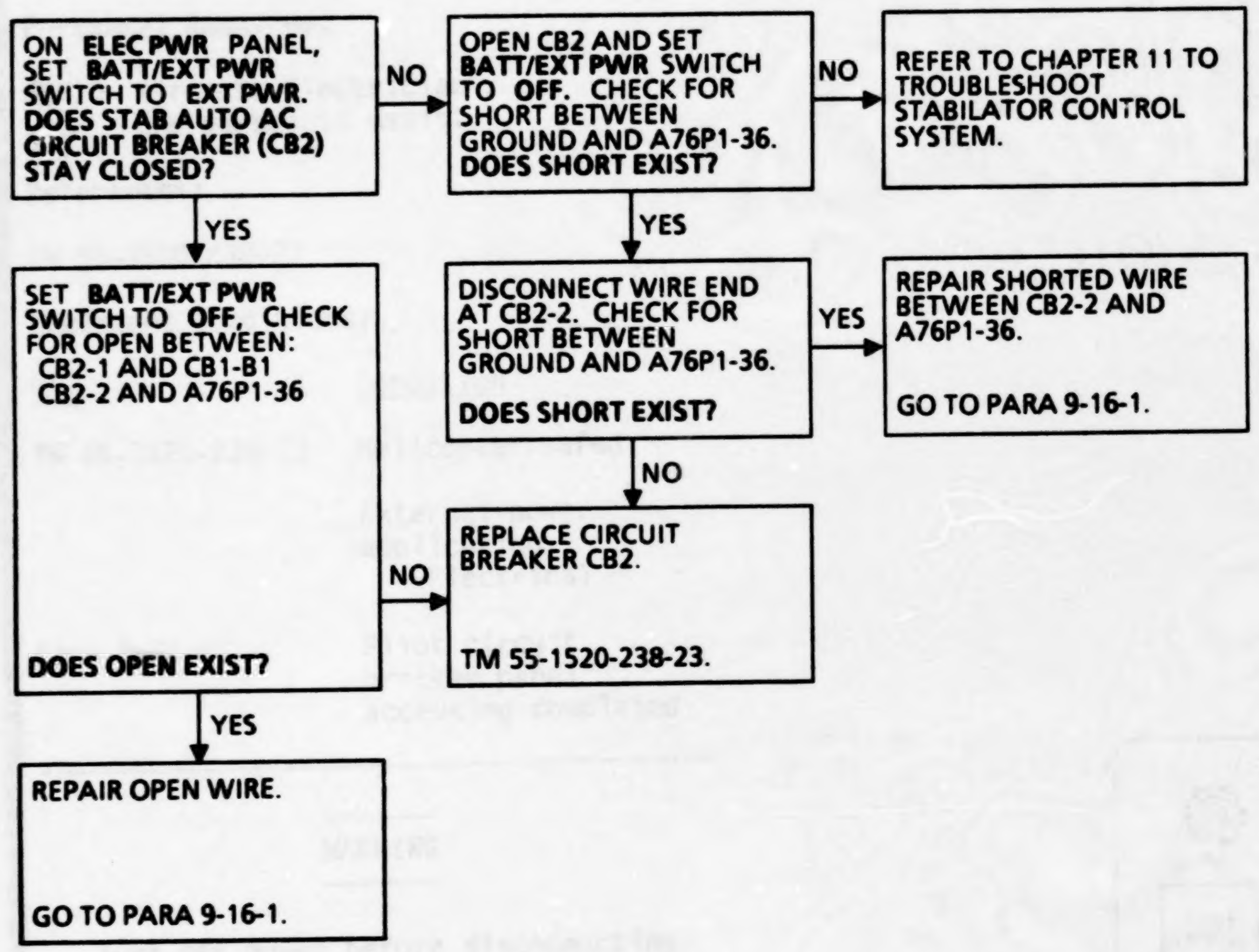
Personnel Required:

References: (para 9-16-19)

Equipment Conditions: (para 9-16-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connecto. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES STAB AUTO AC CIRCUIT BREAKER (CB2) STAY CLOSED?
NO
OPEN CB2 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-36. DOES SHORT EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR CONTROL SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB2-1 AND CB1-B1 CB2-2 AND A76P1-36
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB2-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-36.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB2-2 AND A76P1-36.
GO TO PARA 9-16-1.
NO
NO
REPLACE CIRCUIT BREAKER CB2.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-16-1.

END OF TASK

9-16-22. STAB MAN AC CIRCUIT BREAKER (CB7) - DOES NOT STAY CLOSED OR 115 VAC TO STABILATOR POSITION INDICATOR IS NOT PRESENT AT P76P1-37

Tools: (para 9-16-19)

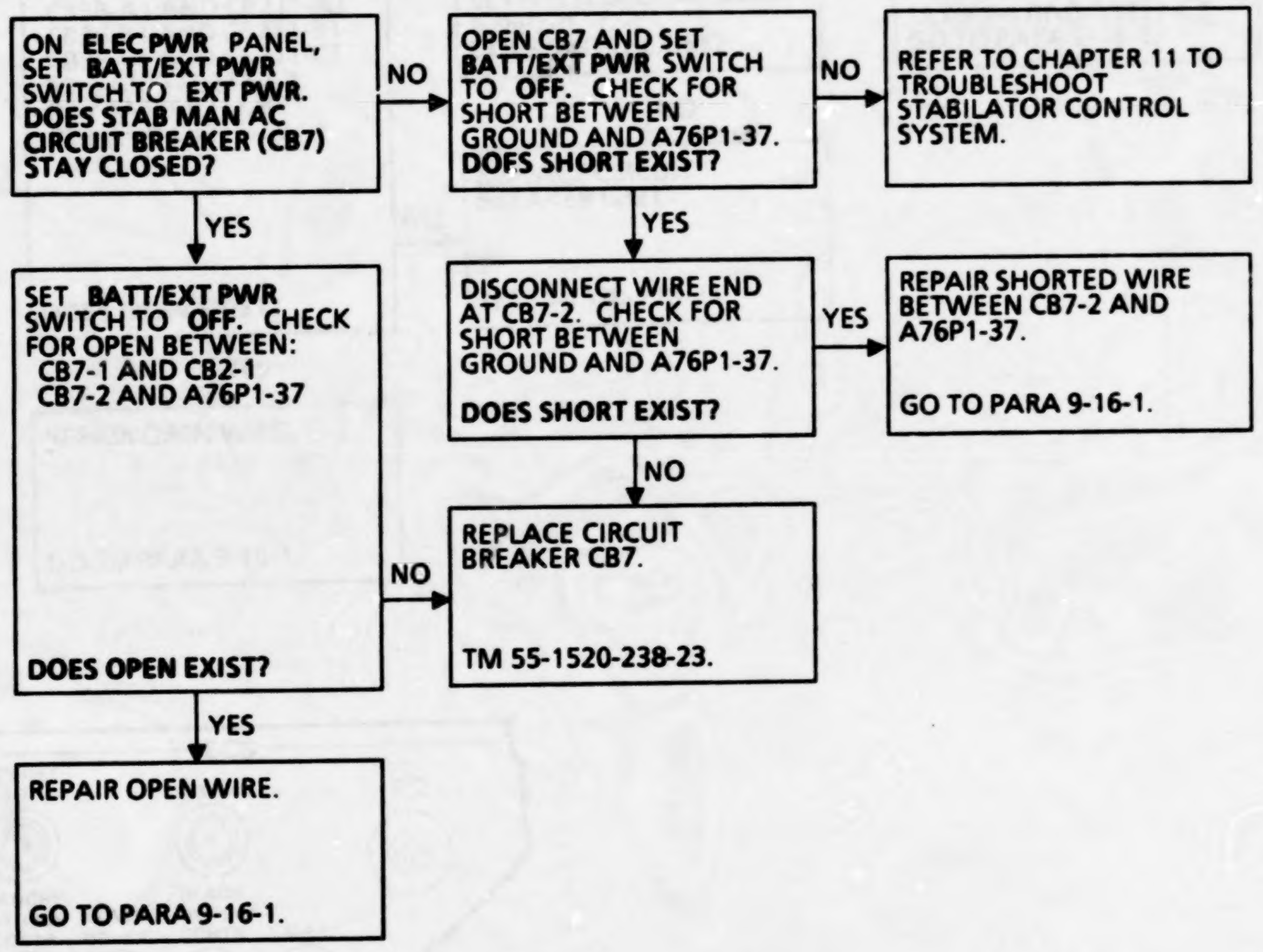
Personnel Required:

References: (para 9-16-19)

Equipment Conditions: (para 9-16-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES STAB MAN AC CIRCUIT BREAKER (CB7) STAY CLOSED?
NO
OPEN CB7 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-37. DOES SHORT EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR CONTROL SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB7-1 AND CB2-1 CB7-2 AND A76P1-37
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB7-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-37.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB7-2 AND A76P1-37.
GO TO PARA 9-16-1.
NO
NO
REPLACE CIRCUIT BREAKER CB7.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-16-1.

END OF TASK

9-16-23. ECS R NOSE GRBX HTR CIRCUIT BREAKER (CB211) - DOES NOT STAY CLOSED OR 115 VAC IS NOT PRESENT AT A76P2-q, -r, -s

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

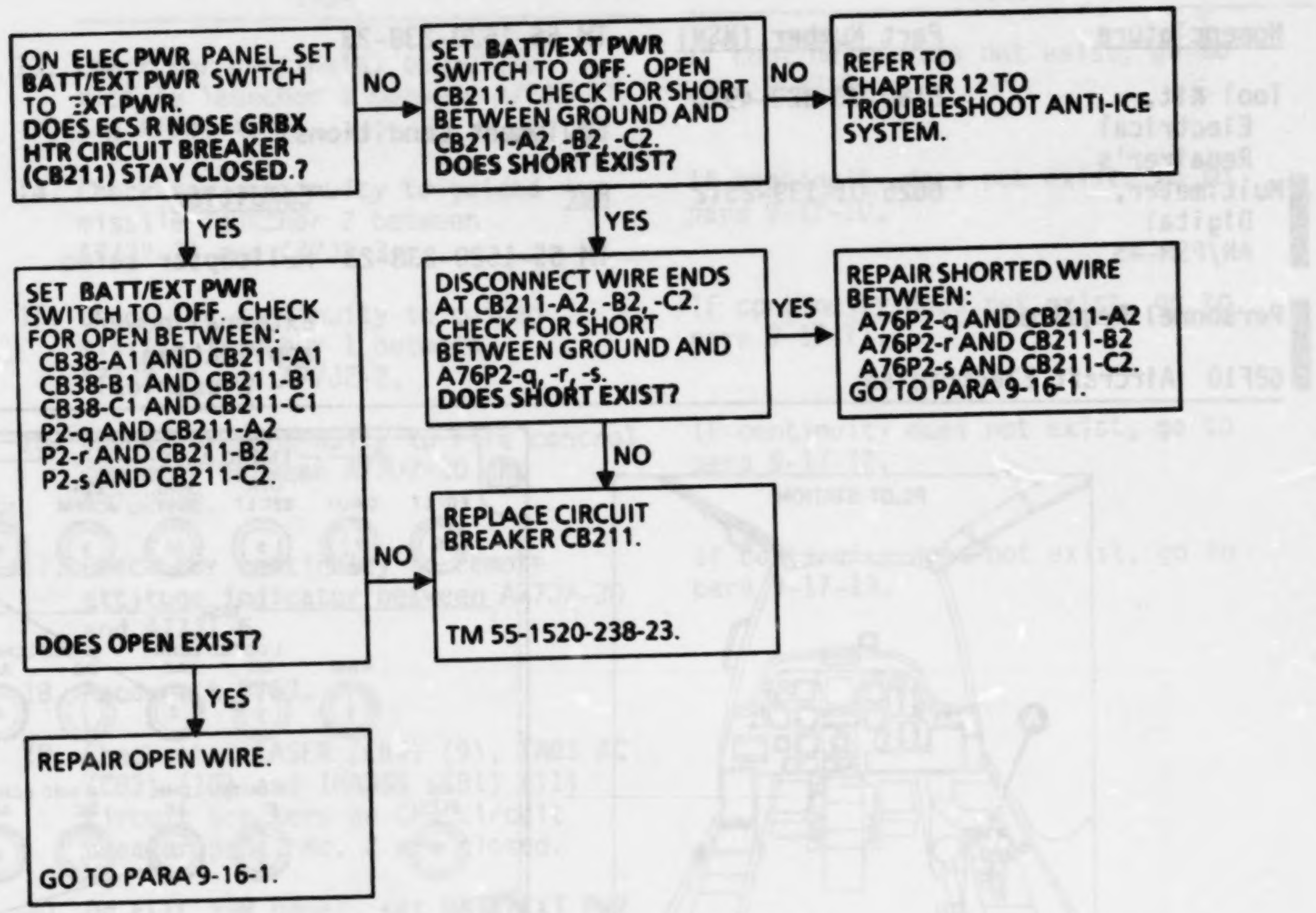
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS R NOSE GRBX HTR CIRCUIT BREAKER (CB211) STAY CLOSED.?

NO: SET BATT/EXT PWR SWITCH TO OFF. OPEN CB211. CHECK FOR SHORT BETWEEN GROUND AND CB211-A2, -B2, -C2. DOES SHORT EXIST?

NO: REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI-ICE SYSTEM.

YES: DISCONNECT WIRE ENDS AT CB211-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-q, -r, -s. DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN:
A76P2-q AND CB211-A2
A76P2-r AND CB211-B2
A76P2-s AND CB211-C2.
GO TO PARA 9-16-1.

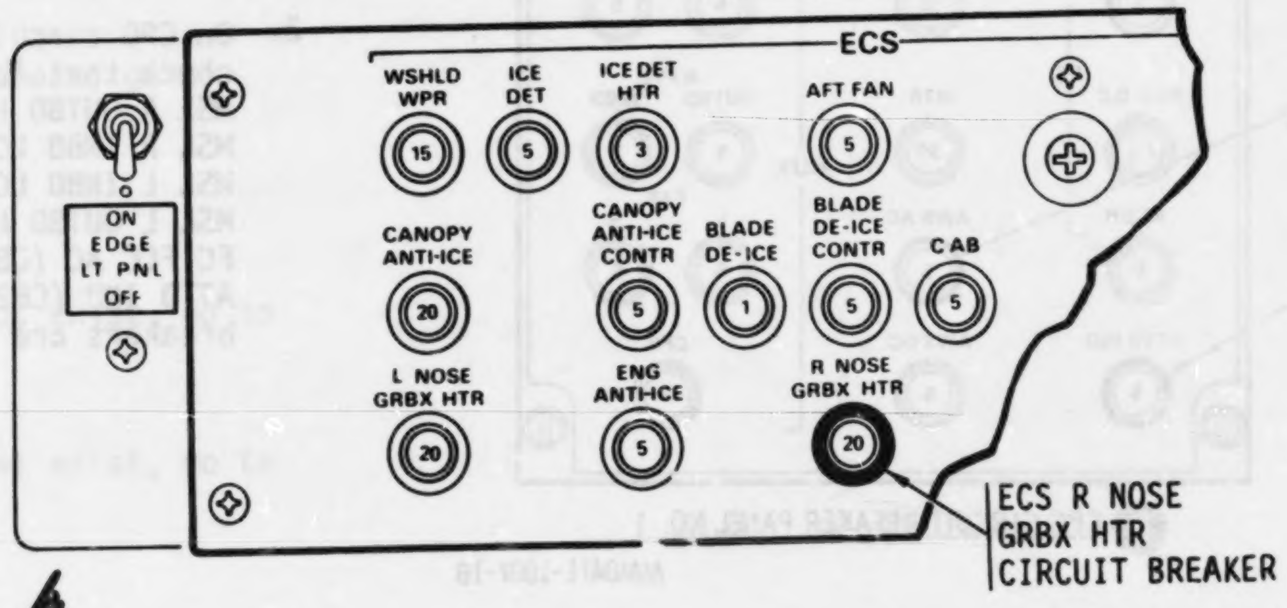
NO: REPLACE CIRCUIT BREAKER CB211. TM 55-1520-238-23.

YES: SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB38-A1 AND CB211-A1
CB38-B1 AND CB211-B1
CB38-C1 AND CB211-C1
P2-q AND CB211-A2
P2-r AND CB211-B2
P2-s AND CB211-C2.
DOES OPEN EXIST?

NO: REPLACE CIRCUIT BREAKER CB211. TM 55-1520-238-23.

YES: REPAIR OPEN WIRE. GO TO PARA 9-16-1.

NO
YES
NO
YES
YES
NO
NO
YES



ECS
WSHLD WPR
15
ICE DET
5
ICE DET HTR
3
AFT FAN
5
ON
EDGE LT PNL
OFF
CANOPY ANTI-ICE
20
CANOPY ANTI-ICE CONTR
5
BLADE DE-ICE
1
BLADE DE-ICE CONTR
5
CAB
5
L NOSE GRBX HTR
20
ENG ANTI-ICE
5
R NOSE GRBX HTR
20
ECS R NOSE GRBX HTR CIRCUIT BREAKER

PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1565B

END OF TASK

9-17-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

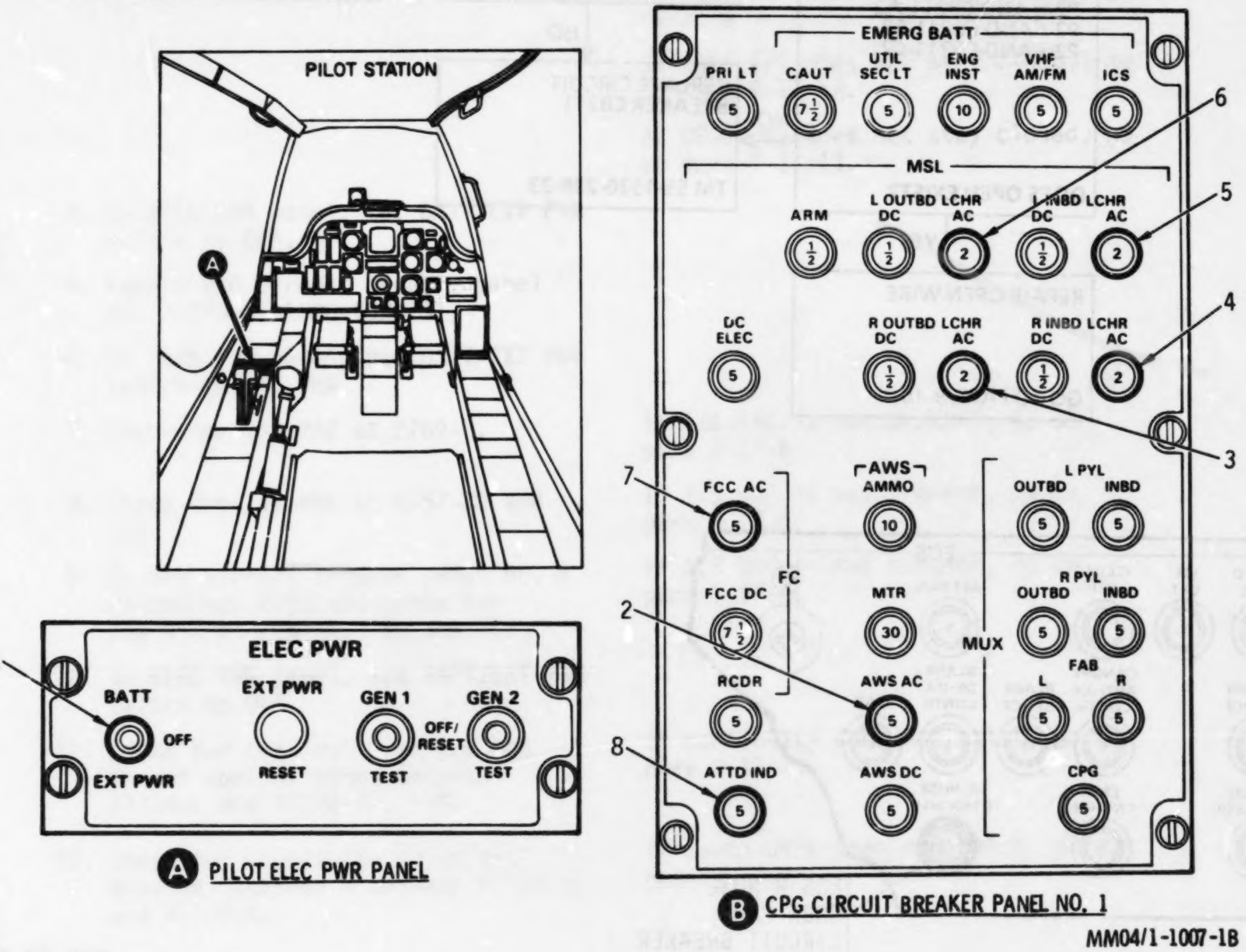
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical



PILOT STATION
A
1
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
TEST
OFF/ RESET
GEN 2
TEST
EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5
MSL
ARM
L OUTBD LCHR DC
AC
L INBD LCHR DC
AC
½
½
2
½
2
DC ELEC
5
R OUTBD LCHR DC
AC
R INBD LCHR DC
AC
½
2
½
2
6
5
4
3
7
FCC AC
5
AWS
AMMO
10
L PYL
OUTBD
INBD
5
5
FC
FCC DC
7½
MTR
30
R PYL
OUTBD
INBD
5
5
MUX
2
RCDR
5
AWS AC
5
FAB
L
R
5
5
8
ATTD IND
5
AWS DC
5
CPG
5

Ⓐ PILOT ELEC PWR PANEL

Ⓑ CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1007-1B

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

A. On electrical power distribution box disconnect P461.

B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and P461-D, -E and -F.	If short exists go to para 9-17-4.
1.1 Check for short between ground and P461-L.	If short exists go to para 9-17-6.
1.2 On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR.	If 115 VAC is not present, go to para 9-2-2.
1.3 On electrical power distribution box, check for 115 VAC at A402J32 -D, -E, -F and -L.	
1.4 On ELEC PWR panel, set BATT/EXT PWR switch to OFF.	
1.5 Reconnect P461.	
1.6 On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR.	
2. On CPG circuit breaker panel no. 1, check that AWS AWS AC (CB11) (2), MSL R OUTBD LCHR AC (CB18) (3), MSL R INBD LCHR AC (CB21) (4), MSL L INBD LCHR AC (CB24) (5), MSL L OUTBD LCHR AC (CB26) (6), FC FCC AC (CB16) (7), and ATTD IND (CB20) (8) circuit breakers are closed.	

GO TO NEXT PAGE

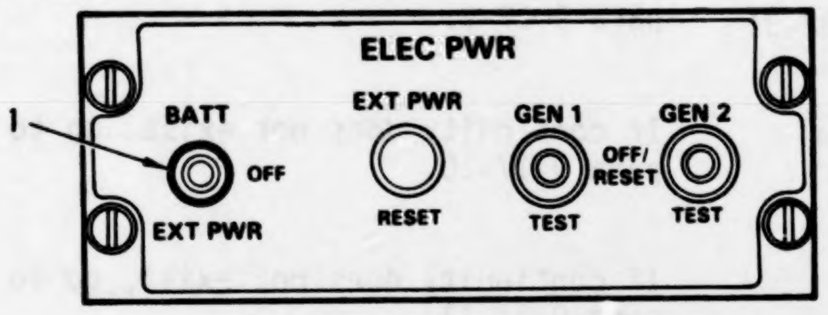
9-17-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) OPERATIONAL CHECK (cont)

TASK	RESULT
3. Check that circuit breakers closed in step 1 remain closed.	If CB11 (2) does not stay closed, go to para 9-17-7. If CB18 (3) does not stay closed, go to para 9-17-8. If CB21 (4) does not stay closed, go to para 9-17-9. If CB24 (5) does not stay closed, go to para 9-17-10. If CB26 (6) does not stay closed, go to para 9-17-11. If CB16 (7) does not stay closed, go to para 9-17-12. If CB20 (8) does not stay closed, go to para 9-17-13.
4. On **ELEC PWR** panel, set **BATT/EXT PWR** switch to **OFF**.	
5. Remove CPG circuit breaker panel No. 1 (TM 55-1520-238-23).	
6. On **ELEC PWR** panel, set **BATT/EXT PWR** switch to **EXT PWR**.	
7. Check for 115 VAC at P769-L.	If 115 VAC is not present, go to para 9-17-6.
8. Check for 115 VAC at P767-30 and -31.	If 115 VAC is not present, go to para 9-17-5.
9. On CPG circuit breaker panel No. 2 disconnect P763 and check for 115 VAC at P763-A, -B, and -C.	If 115 VAC is not present, go to para 9-17-4.
10. On **ELEC PWR** panel, set **BATT/EXT PWR** switch to **OFF**.	
11. Check for continuity to gun and turret control boxes between A77J4-L and A77J2-12, -19.	If continuity does not exist, go to para 9-17-7.
12. Check for continuity to guided missile launcher 4 between A77J2-31 and A77J2-5.	If continuity does not exist, go to para 9-17-8.

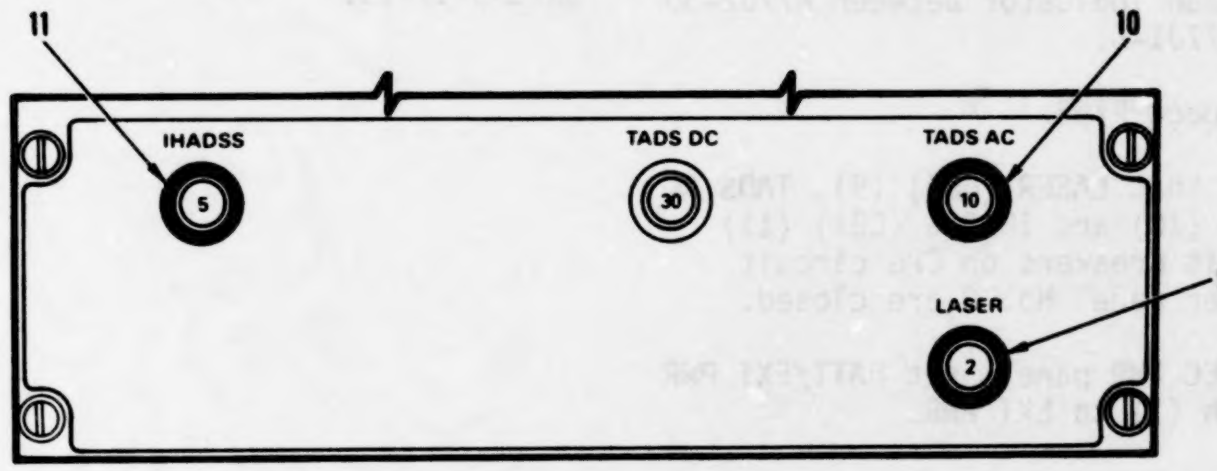
TASK	RESULT
13. Check for continuity to guided missile launcher 3 between A77J2-31 and A77J2-4.	If continuity does not exist, go to para 9-17-9.
14. Check for continuity to guided missile launcher 2 between A77J2-31 and A77J2-3.	If continuity does not exist, go to para 9-17-10.
15. Check for continuity to guided missile launcher 1 between A77J2-31 and A77J2-2.	If continuity does not exist, go to para 9-17-11.
16. Check for continuity to fire control computer between A77J2-30 and A77J2-35.	If continuity does not exist, go to para 9-17-12.
17. Check for continuity to remote attitude indicator between A77J2-30 and A77J1-6.	If continuity does not exist, go to para 9-17-13.
18. Reconnect P763.	
19. Check that **LASER** (CB4) (9), **TADS AC** (CB3) (10) and **IHADSS** (CB1) (11) circuit breakers on CPG circuit breaker panel No. 2 are closed.	
20. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	

GO TO NEXT PAGE

9-17-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) OPERATIONAL CHECK (cont)



PILOT ELEC PWR PANEL



CPG CIRCUIT BREAKER PANEL NO. 2

MM04/1-1007-3

TASK	RESULT
21. Check that circuit breakers closed in step 19 remain closed.	If CB4 (9) does not stay closed, go to para 9-17-4. If CB3 (10) does not stay closed, go to para 9-17-15. If CB1 (11) does not stay closed, go to para 9-17-16.

WARNING

Avoid touching circuit breaker panels to airframe, or crossing circuit breaker terminals with any tools. Doing so could cause death or serious injury.

TASK	RESULT
22. With EXT PWR off, connect P767 and P769; disconnect P761 and A97P1.	
23. With EXT PWR applied, check for 115 VAC to laser electronic unit at A97J1-D, -B, -A.	If 15 VAC is not present, go to para 9-17-14.
24. Check for 115 VAC to TADS power supply and ORT at A97J1-H, -F, -E.	If 115 VAC is not present, go to para 9-17-15.
25. Check for 115 VAC at IHADSS SEU at A97P1-E, -D, -C.	If 115 VAC is not present, go to para 9-17-16.

C. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.

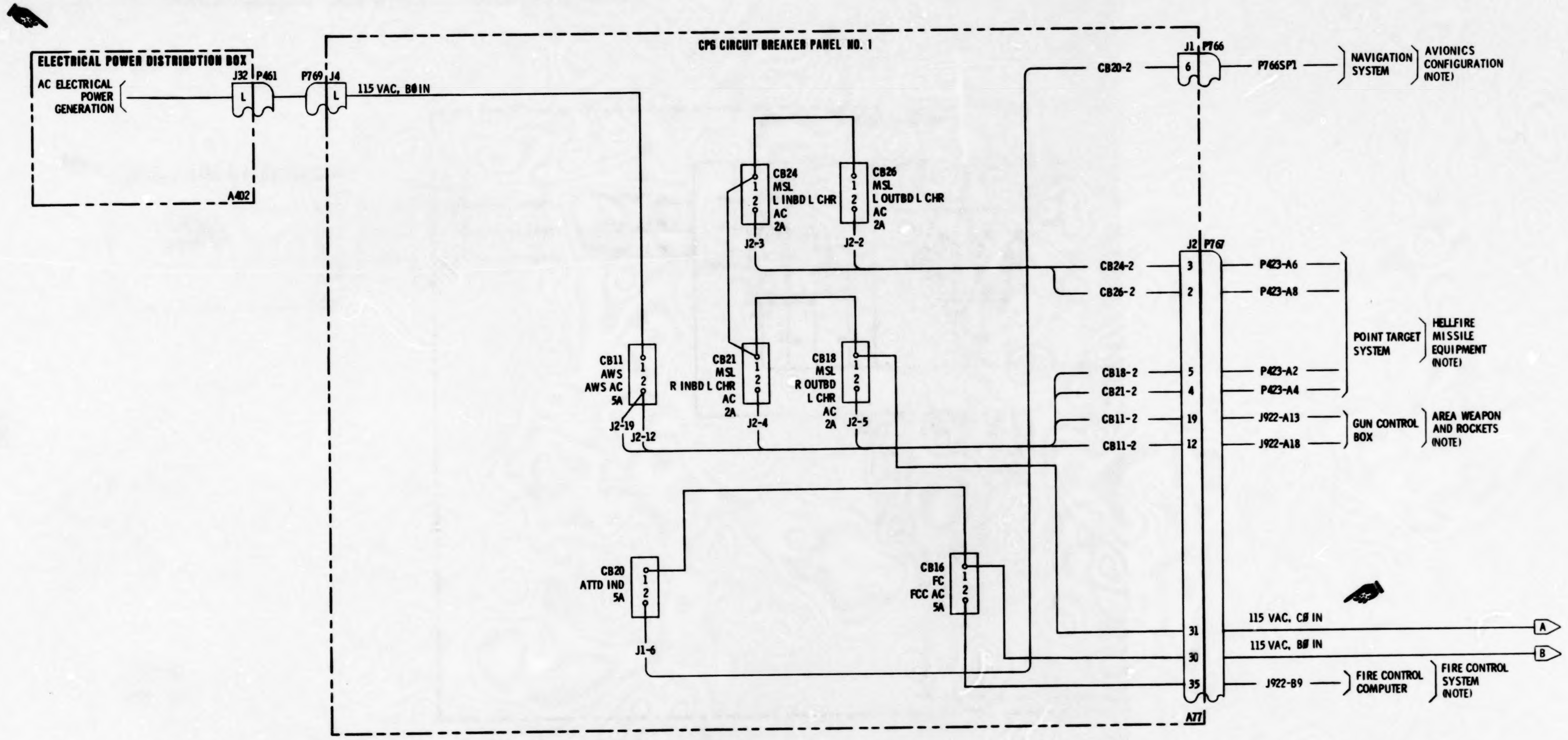
D. Reconnect P761 and A97P1.

E. Reinstall CPG circuit breaker panel No. 1 (TM 55-1520-238-23).

F. Remove external power - Electrical (TM 55-1520-238-23).

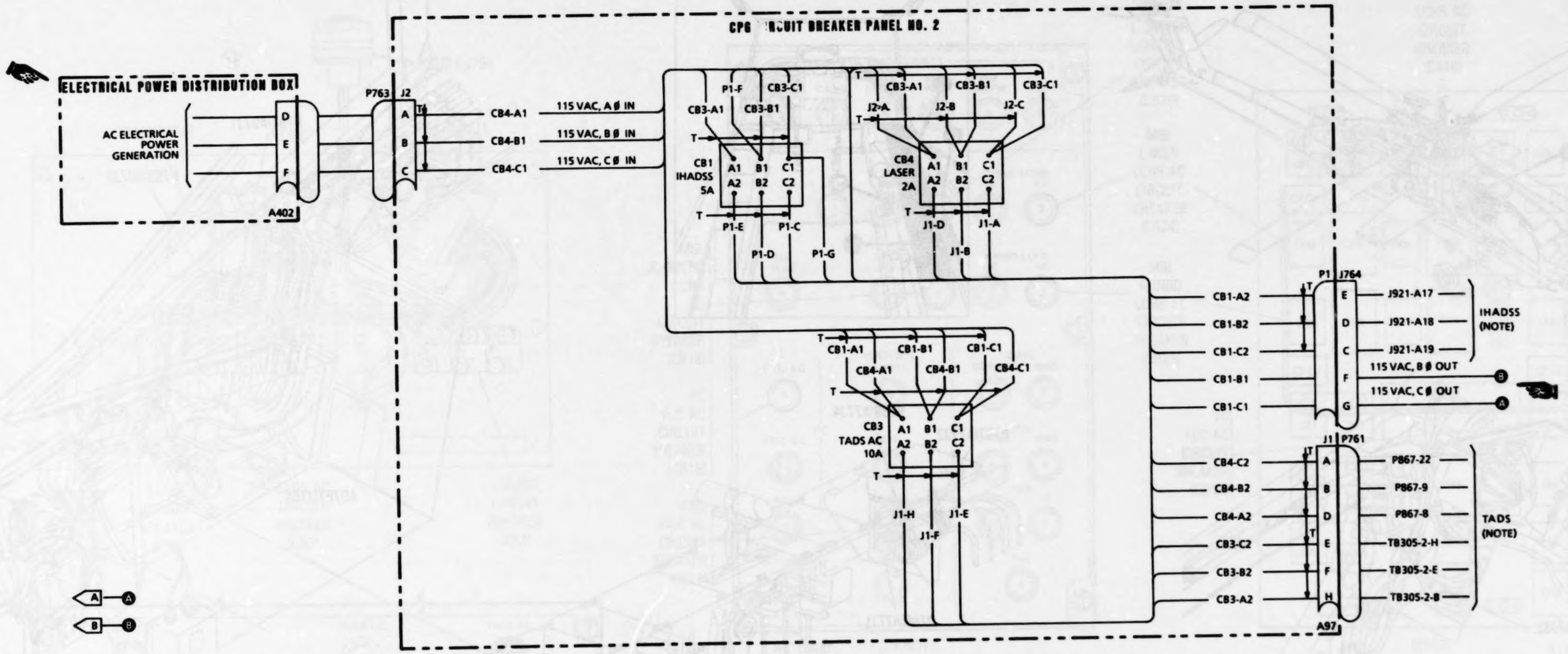
END OF TASK

9-17-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) INTERCONNECTION DIAGRAM


ELECTRICAL POWER DISTRIBUTION BOX
AC ELECTRICAL POWER GENERATION
J32
P461
L
A402
P769
J4
L
115 VAC, BØIN
CPG CIRCUIT BREAKER PANEL NO. 1
CB24
1
2
MSL
L INBD L CHR
AC
2A
J2-3
CB26
1
2
MSL
L OUTBD L CHR
AC
2A
J2-2
CB11
AWS
AWS AC
5A
1
2
J2-19
J2-12
CB21
MSL
R INBD L CHR
AC
2A
1
2
J2-4
CB18
MSL
R OUTBD
L CHR
AC
2A
1
2
J2-5
CB20
ATTD IND
5A
1
2
J1-6
CB16
FC
FCC AC
5A
1
2
J1
P766
CB20-2
6
P766SP1
NAVIGATION SYSTEM
AVIONICS CONFIGURATION (NOTE)
J2
P767
CB24-2
3
P423-A6
CB26-2
2
P423-A8
POINT TARGET SYSTEM
HELLFIRE MISSILE EQUIPMENT (NOTE)
CB18-2
5
P423-A2
CB21-2
4
P423-A4
CB11-2
19
J922-A13
CB11-2
12
J922-A18
GUN CONTROL BOX
AREA WEAPON AND ROCKETS (NOTE)
31
115 VAC, CØ IN
A
30
115 VAC, BØ IN
B
35
J922-B9
FIRE CONTROL COMPUTER
FIRE CONTROL SYSTEM (NOTE)
A77

SHEET 1 OF 2 MM04/1-758-1C

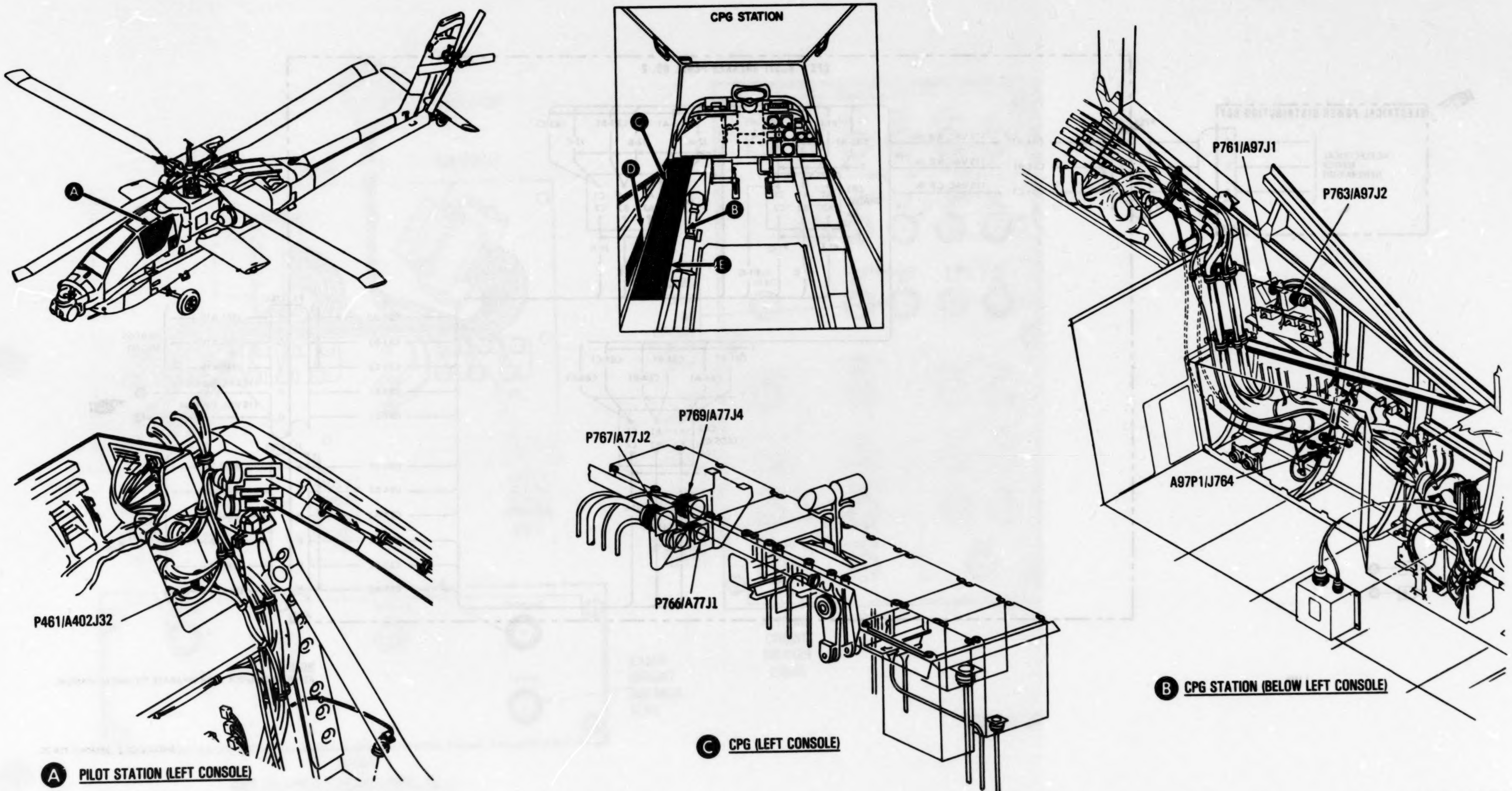
9-17-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) INTERCONNECTION DIAGRAM (cont)


ELECTRICAL POWER DISTRIBUTION BOX
AC ELECTRICAL POWER GENERATION
D
E
F
A402
P763
J2
A
B
C
T
CB4-A1
CB4-B1
CB4-C1
115 VAC, A ø IN
115 VAC, B ø IN
115 VAC, C ø IN
CPG CIRCUIT BREAKER PANEL NO. 2
P1-F
CB3-C1
CB3-A1
CB3-B1
CB1
IHADSS
5A
A1 B1 C1
A2 B2 C2
P1-E
P1-C
P1-D
P1-G
CB3-A1
CB3-B1
CB3-C1
J2-A
J2-B
J2-C
CB4
LASER
2A
J1-D
J1-A
J1-B
CB1-A1
CB1-B1
CB1-C1
CB4-A1
CB4-B1
CB4-C1
CB3
TADS AC
10A
J1-H
J1-E
J1-F
CB1-A2
CB1-B2
CB1-C2
CB1-B1
CB1-C1
P1
J764
E
D
C
F
G
J921-A17
J921-A18
J921-A19
IHADSS (NOTE)
115 VAC, B ø OUT
115 VAC, C ø OUT
B
A
CB4-C2
CB4-B2
CB4-A2
CB3-C2
CB3-B2
CB3-A2
J1
P761
A
B
D
E
F
H
A97
P867-22
P867-9
P867-8
TB305-2-H
TB305-2-E
TB305-2-B
TADS (NOTE)

NOTE:
REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

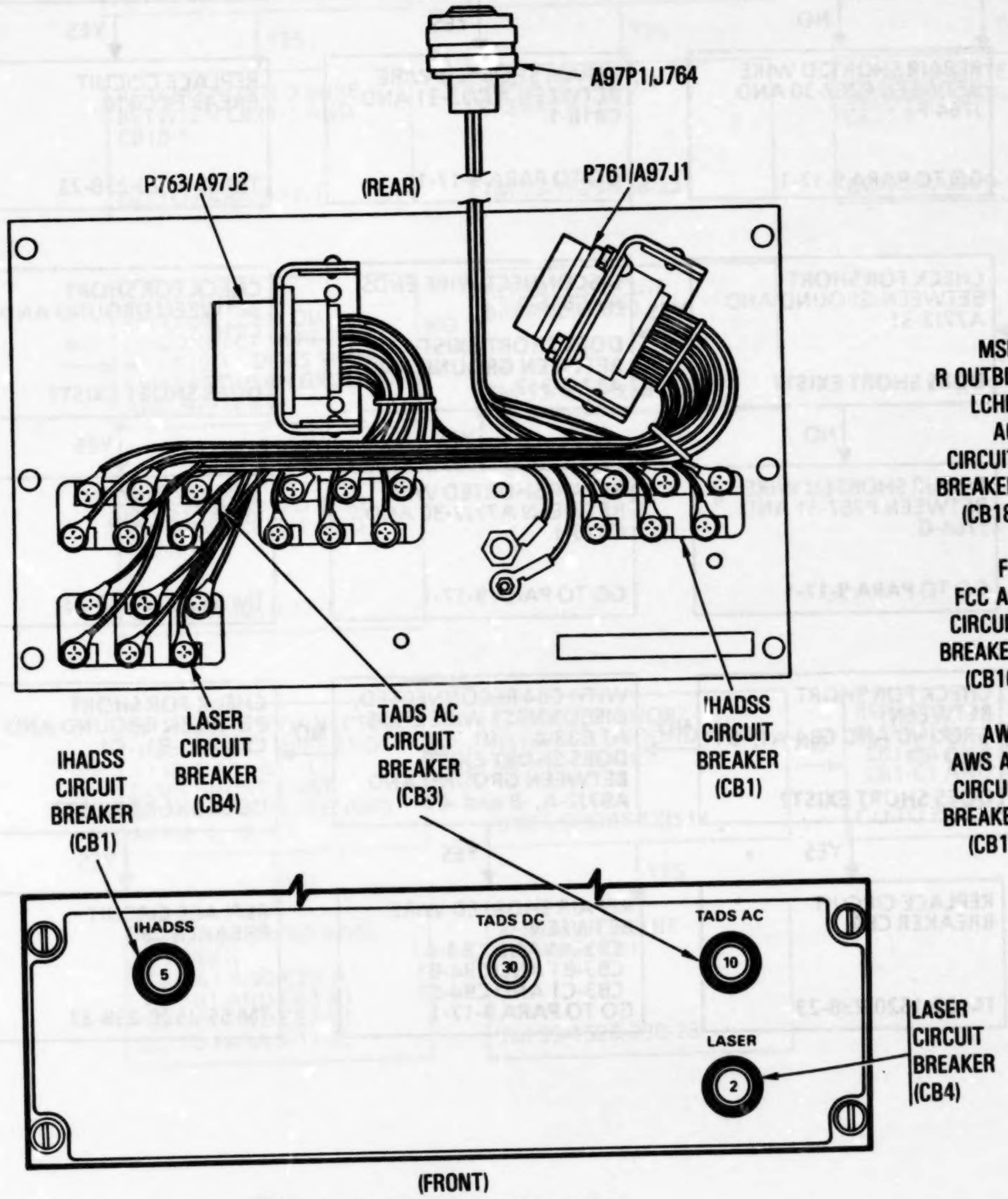
SHEET 2 OF 2 MM04/1-758-2C

9-17-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

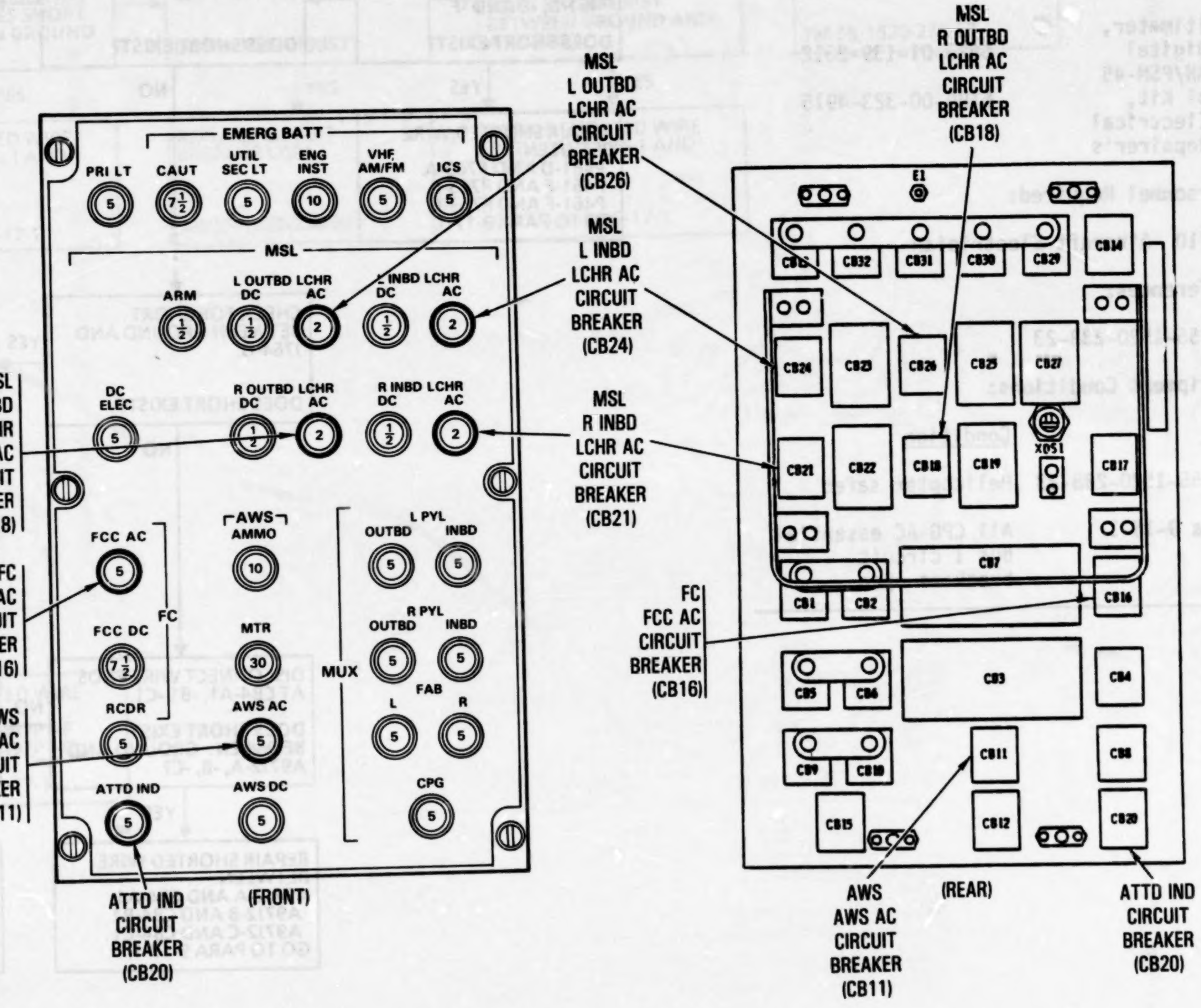

A
CPG STATION
C
D
B
E
P461/A402J32
A PILOT STATION (LEFT CONSOLE)
P769/A77J4
P767/A77J2
P766/A77J1
C CPG (LEFT CONSOLE)
P761/A97J1
P763/A97J2
A97P1/J764
B CPG STATION (BELOW LEFT CONSOLE)

MM04/1-1058-1B

9-17-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


A97P1/J764
P763/A97J2
(REAR)
P761/A97J1
IHADSS CIRCUIT BREAKER (CB1)
LASER CIRCUIT BREAKER (CB4)
TADS AC CIRCUIT BREAKER (CB3)
IHADSS CIRCUIT BREAKER (CB1)
IHADSS
5
TADS DC
30
TADS AC
10
LASER
2
LASER CIRCUIT BREAKER (CB4)
(FRONT)

D CPG CIRCUIT BREAKER PANEL NO. 2


EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5
MSL
ARM
L OUTBD LCHR DC AC
L INBD LCHR DC AC
½
½
2
½
2
DC ELEC
5
R OUTBD LCHR DC AC
R INBD LCHR DC AC
½
2
½
2
MSL R OUTBD LCHR AC CIRCUIT BREAKER (CB18)
AWS
AMMO
10
FCC AC
5
L PYL
OUTBD
INBD
5
5
FC
FCC AC CIRCUIT BREAKER (CB16)
FCC DC
7½
MTR
30
MUX
R PYL
OUTBD
INBD
5
5
FAB
L
R
5
5
RCDR
5
AWS AC
5
AWS AWS AC CIRCUIT BREAKER (CB11)
ATTD IND
5
AWS DC
5
CPG
5
ATTD IND CIRCUIT BREAKER (CB20)
(FRONT)
MSL L OUTBD LCHR AC CIRCUIT BREAKER (CB26)
MSL L INBD LCHR AC CIRCUIT BREAKER (CB24)
MSL R INBD LCHR AC CIRCUIT BREAKER (CB21)
FC FCC AC CIRCUIT BREAKER (CB16)
MSL R OUTBD LCHR AC CIRCUIT BREAKER (CB18)
E1
CB33
CB32
CB31
CB30
CB29
CB14
CB24
CB23
CB26
CB25
CB27
CB21
CB22
CB18
CB19
CB17
XDS1
CB7
CB1
CB2
CB16
CB5
CB6
CB3
CB4
CB11
CB8
CB9
CB10
CB15
CB12
CB20
AWS AWS AC CIRCUIT BREAKER (CB11)
(REAR)
ATTD IND CIRCUIT BREAKER (CB20)

E CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1058-2A

9-17-4. SHORT EXISTS BETWEEN GROUND AND P461-D, -E OR -F

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

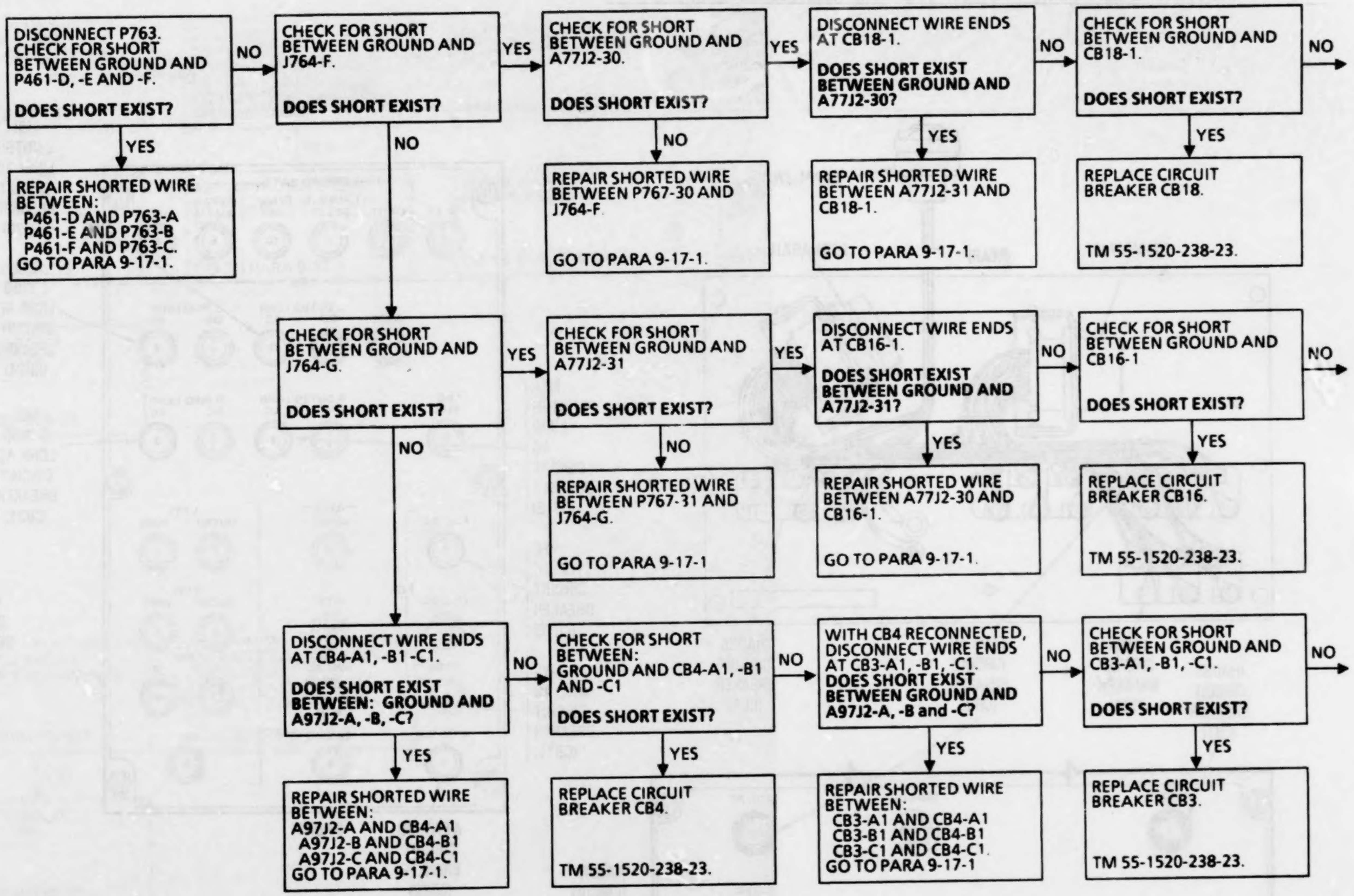
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-1	All CPG AC essential bus 1 circuit breakers open



DISCONNECT P763. CHECK FOR SHORT BETWEEN GROUND AND P461-D, -E AND -F. DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN: P461-D AND P763-A P461-E AND P763-B P461-F AND P763-C. GO TO PARA 9-17-1.

CHECK FOR SHORT BETWEEN GROUND AND J764-F. DOES SHORT EXIST?

CHECK FOR SHORT BETWEEN GROUND AND A77J2-30. DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN P767-30 AND J764-F. GO TO PARA 9-17-1.

DISCONNECT WIRE ENDS AT CB18-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-30?

REPAIR SHORTED WIRE BETWEEN A77J2-31 AND CB18-1. GO TO PARA 9-17-1.

CHECK FOR SHORT BETWEEN GROUND AND CB18-1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB18. TM 55-1520-238-23.

CHECK FOR SHORT BETWEEN GROUND AND J764-G. DOES SHORT EXIST?

CHECK FOR SHORT BETWEEN GROUND AND A77J2-31 DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN P767-31 AND J764-G. GO TO PARA 9-17-1

DISCONNECT WIRE ENDS AT CB16-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-31?

REPAIR SHORTED WIRE BETWEEN A77J2-30 AND CB16-1. GO TO PARA 9-17-1.

CHECK FOR SHORT BETWEEN GROUND AND CB16-1 DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB16. TM 55-1520-238-23.

DISCONNECT WIRE ENDS AT CB4-A1, -B1 -C1. DOES SHORT EXIST BETWEEN: GROUND AND A97J2-A, -B, -C?

REPAIR SHORTED WIRE BETWEEN: A97J2-A AND CB4-A1 A97J2-B AND CB4-B1 A97J2-C AND CB4-C1 GO TO PARA 9-17-1.

CHECK FOR SHORT BETWEEN: GROUND AND CB4-A1, -B1 AND -C1 DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB4. TM 55-1520-238-23.

WITH CB4 RECONNECTED, DISCONNECT WIRE ENDS AT CB3-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND A97J2-A, -B and -C?

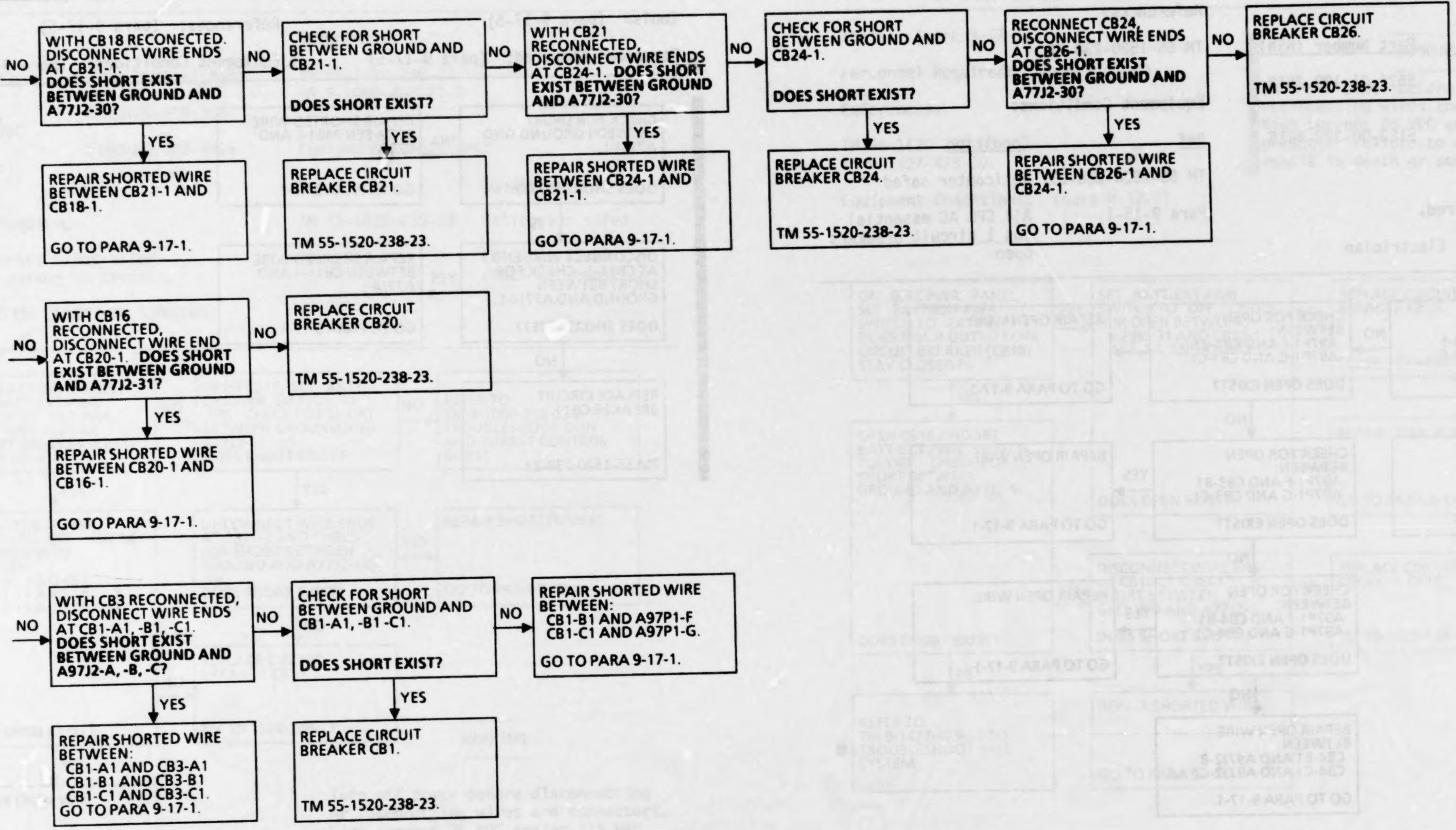
REPAIR SHORTED WIRE BETWEEN: CB3-A1 AND CB4-A1 CB3-B1 AND CB4-B1 CB3-C1 AND CB4-C1. GO TO PARA 9-17-1

CHECK FOR SHORT BETWEEN GROUND AND CB3-A1, -B1, -C1. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB3. TM 55-1520-238-23.

GO TO NEXT PAGE

9-17-4. SHORT EXISTS BETWEEN GROUND AND P461-D, -E OR -F (cont)


NO
WITH CB18 RECONECTED. DISCONNECT WIRE ENDS AT CB21-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-30?
YES
REPAIR SHORTED WIRE BETWEEN CB21-1 AND CB18-1. GO TO PARA 9-17-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB21-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB21. TM 55-1520-238-23.
NO
WITH CB21 RECONNECTED, DISCONNECT WIRE ENDS AT CB24-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-30?
YES
REPAIR SHORTED WIRE BETWEEN CB24-1 AND CB21-1. GO TO PARA 9-17-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB24-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB24. TM 55-1520-238-23.
NO
RECONNECT CB24, DISCONNECT WIRE ENDS AT CB26-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-30?
YES
REPAIR SHORTED WIRE BETWEEN CB26-1 AND CB24-1. GO TO PARA 9-17-1.
NO
REPLACE CIRCUIT BREAKER CB26. TM 55-1520-238-23.
NO
WITH CB16 RECONNECTED, DISCONNECT WIRE END AT CB20-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-31?
YES
REPAIR SHORTED WIRE BETWEEN CB20-1 AND CB16-1. GO TO PARA 9-17-1.
NO
REPLACE CIRCUIT BREAKER CB20. TM 55-1520-238-23.
NO
WITH CB3 RECONNECTED, DISCONNECT WIRE ENDS AT CB1-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND A97J2-A, -B, -C?
YES
REPAIR SHORTED WIRE BETWEEN: CB1-A1 AND CB3-A1 CB1-B1 AND CB3-B1 CB1-C1 AND CB3-C1. GO TO PARA 9-17-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB1-A1, -B1 -C1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB1. TM 55-1520-238-23.
NO
REPAIR SHORTED WIRE BETWEEN: CB1-B1 AND A97P1-F CB1-C1 AND A97P1-G. GO TO PARA 9-17-1.

END OF TASK

9-17-5. 115 VAC - IS NOT PRESENT AT P767-30, -31

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

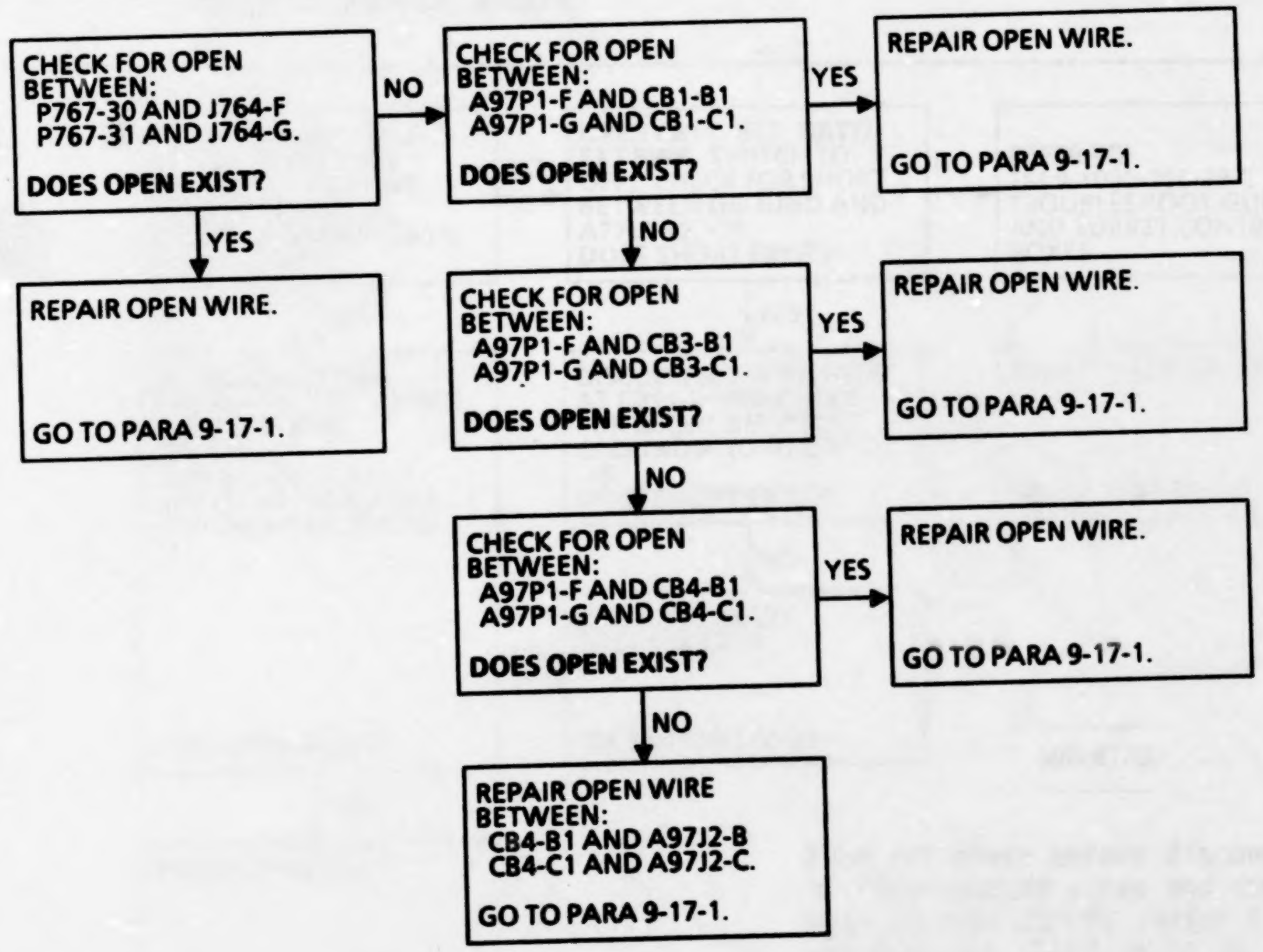
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-1	All CPG AC essential bus 1 circuit breakers open


CHECK FOR OPEN BETWEEN: P767-30 AND J764-F P767-31 AND J764-G. DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.
CHECK FOR OPEN BETWEEN: A97P1-F AND CB1-B1 A97P1-G AND CB1-C1. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.
NO
CHECK FOR OPEN BETWEEN: A97P1-F AND CB3-B1 A97P1-G AND CB3-C1. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.
NO
CHECK FOR OPEN BETWEEN: A97P1-F AND CB4-B1 A97P1-G AND CB4-C1. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.
NO
REPAIR OPEN WIRE BETWEEN: CB4-B1 AND A97J2-B CB4-C1 AND A97J2-C. GO TO PARA 9-17-1.

END OF TASK

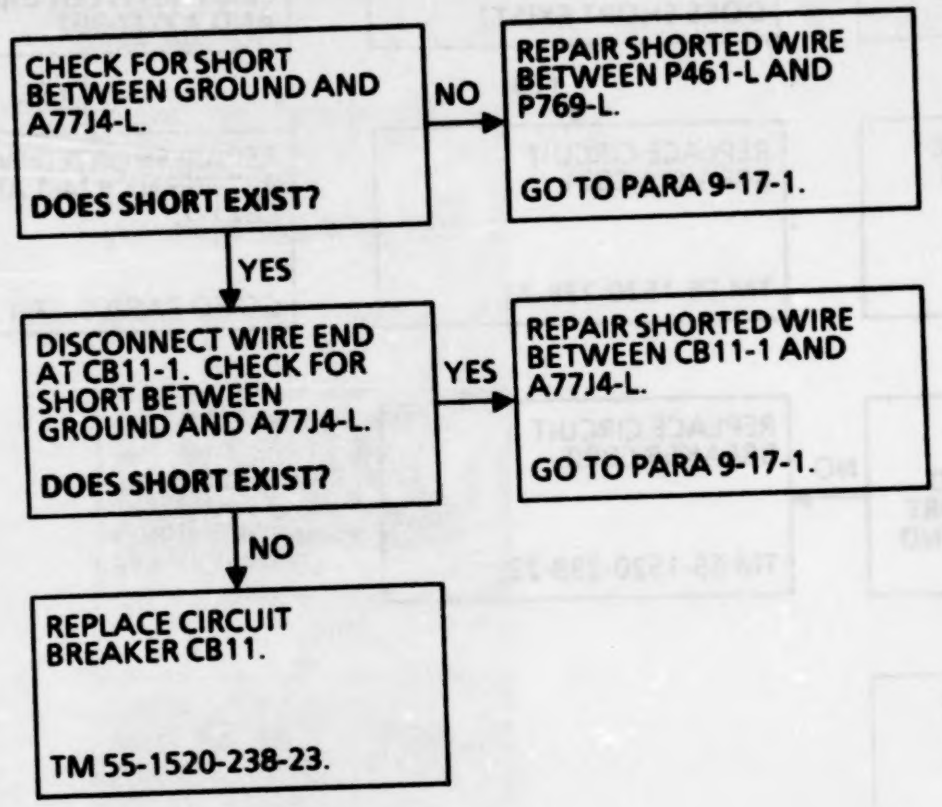
9-17-6. SHORT EXISTS BETWEEN GROUND AND P461-L

Tools: (para 9-17-5)

Personnel Required: (para 9-17-5)

References: (para 9-17-5)

Equipment Conditions: (para 9-17-5)


CHECK FOR SHORT BETWEEN GROUND AND A77J4-L. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN P461-L AND P769-L. GO TO PARA 9-17-1.
YES
DISCONNECT WIRE END AT CB11-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-L. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB11-1 AND A77J4-L. GO TO PARA 9-17-1.
NO
REPLACE CIRCUIT BREAKER CB11. TM 55-1520-238-23.

9-17-7. AWS AWS AC CIRCUIT BREAKER (CB11) - DOES NOT STAY CLOSED OR CONTINUITY TO GUN AND TURRET CONTROL BOXES DOES NOT EXIST BETWEEN A77J4-L AND A77J2-12, -19

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

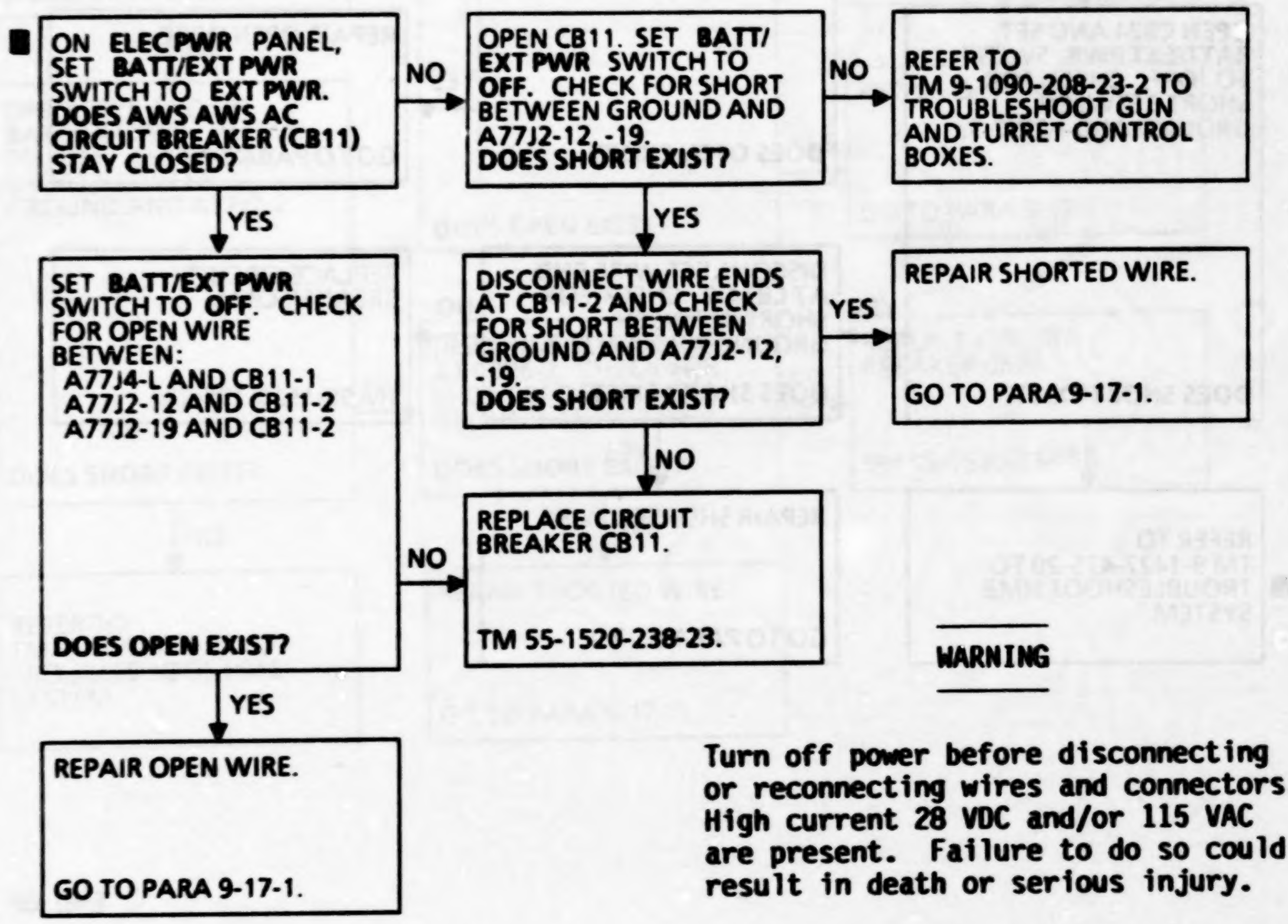
References:

TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES AWS AWS AC CIRCUIT BREAKER (CB11) STAY CLOSED?
NO
OPEN CB11. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-12, -19. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT GUN AND TURRET CONTROL BOXES.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN WIRE BETWEEN: A77J4-L AND CB11-1 A77J2-12 AND CB11-2 A77J2-19 AND CB11-2 DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB11-2 AND CHECK FOR SHORT BETWEEN GROUND AND A77J2-12, -19. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
NO
REPLACE CIRCUIT BREAKER CB11. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-17-8. MSL R OUTBD LCHR AC CIRCUIT BREAKER (CB18) - DOES NOT STAY CLOSED OR CONTINUITY TO MISSILE LAUNCHER 4 DOES NOT EXIST BETWEEN A77J2-5 AND -31

Tools: (para 9-17-7)

Personnel Required: (para 9-17-7)

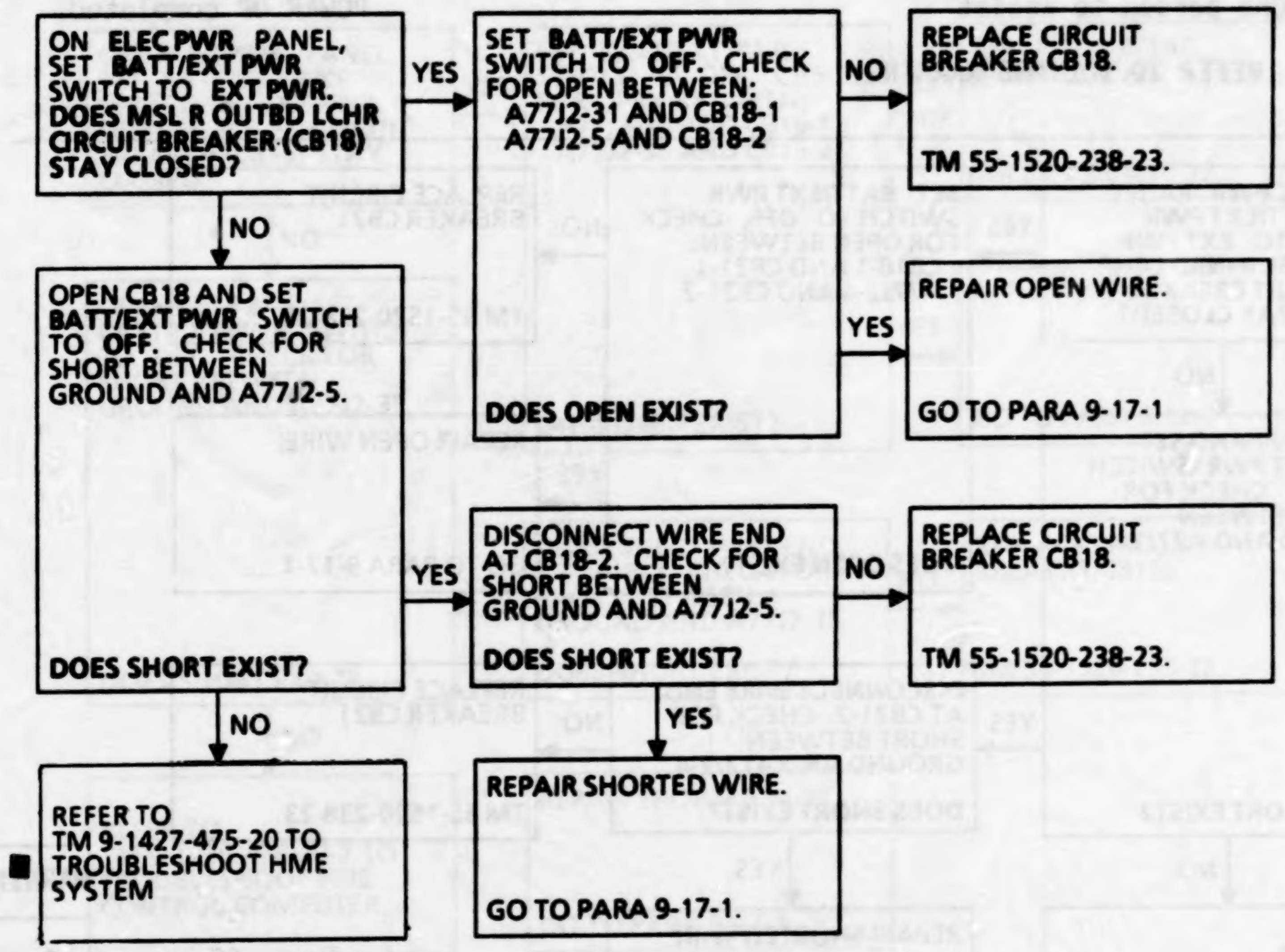
References:

TM 55-1520-238-23
TM 9-1427-475-20

Equipment Conditions: (para 9-17-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL R OUTBD LCHR CIRCUIT BREAKER (CB18) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: A77J2-31 AND CB18-1 A77J2-5 AND CB18-2 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB18. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1
NO
OPEN CB18 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-5. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB18-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-5. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB18. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT HME SYSTEM

END OF TASK

9-17-9. MSL R INBD LCHR AC CIRCUIT BREAKER (CB21) - DOES NOT STAY CLOSED OR CONTINUITY TO MISSILE LAUNCHER 3 DOES NOT EXIST BETWEEN A77J2-31 AND -4

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

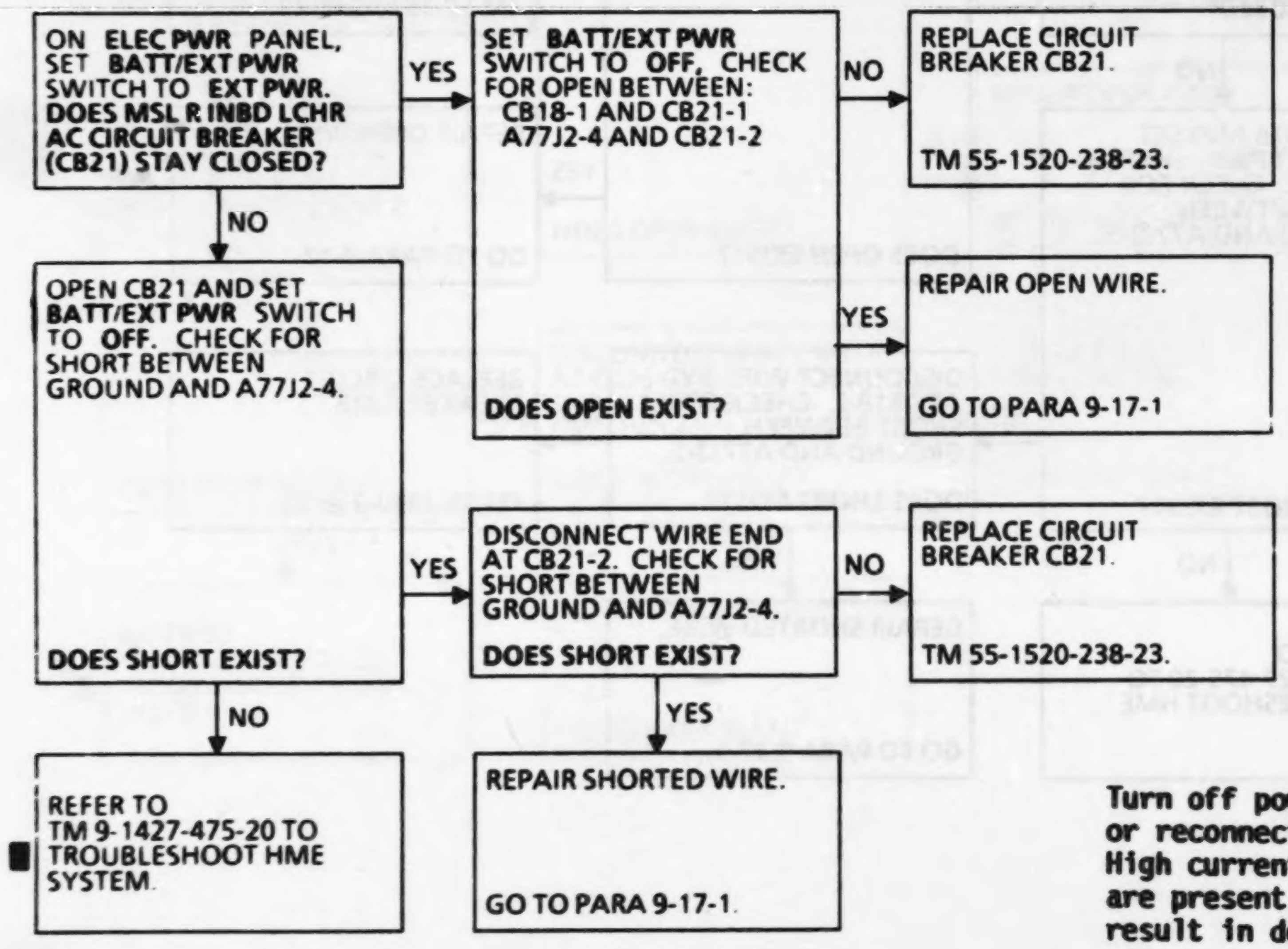
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 9-1427-475-20

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL R INBD LCHR AC CIRCUIT BREAKER (CB21) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB18-1 AND CB21-1 A77J2-4 AND CB21-2
NO
REPLACE CIRCUIT BREAKER CB21. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1
DOES OPEN EXIST?
NO
OPEN CB21 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-4.
DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB21-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-4.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB21. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT HME SYSTEM.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-17-10. MSL L INBD LCHR AC CIRCUIT BREAKER (CB24) - DOES NOT STAY CLOSED OR CONTINUITY TO MISSILE LAUNCHER 2 DOES NOT EXIST BETWEEN A77J2-31 AND -3

Tools: (para 9-17-9)

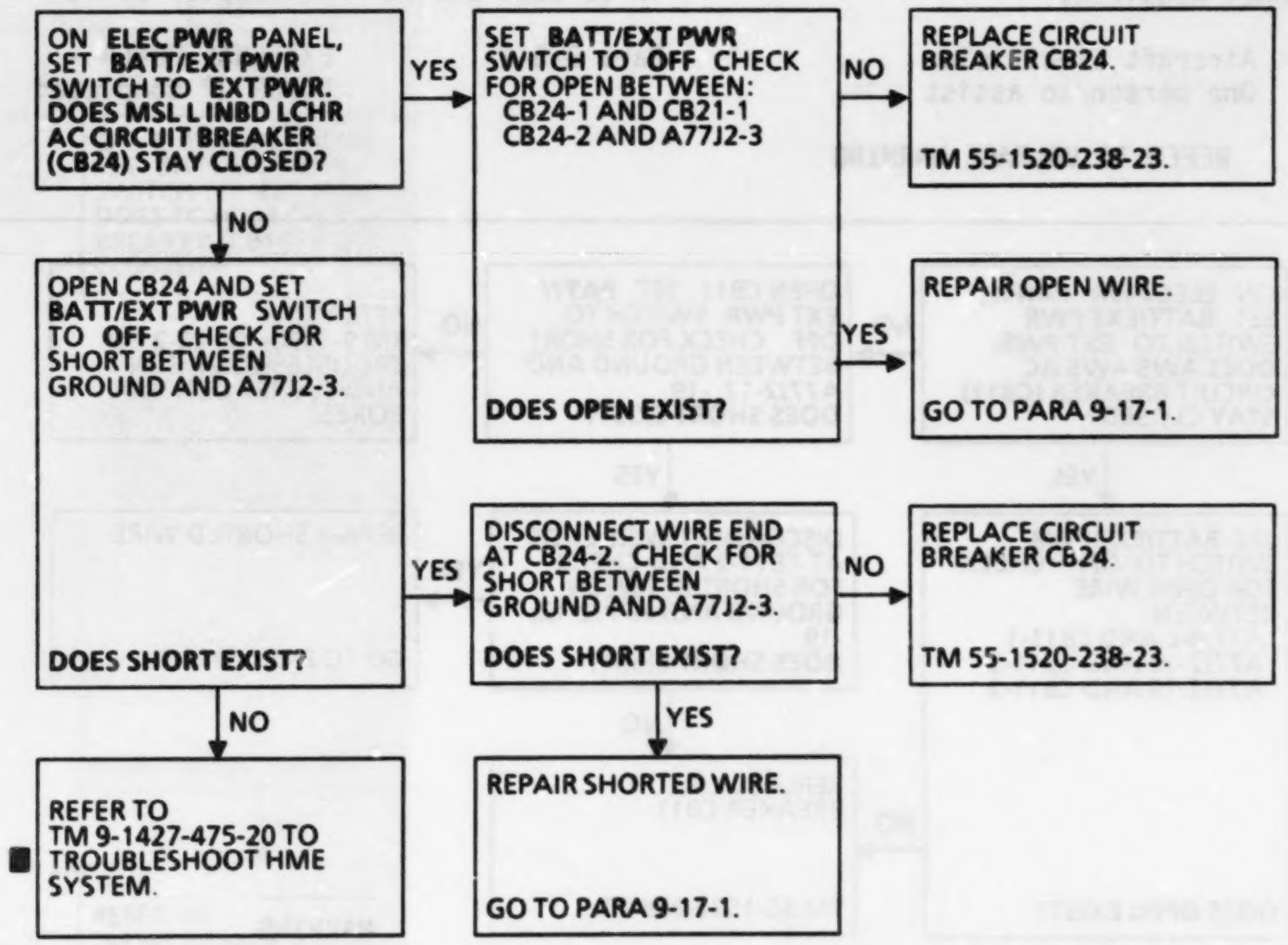
Personnel Required: (para 9-17-9)

References: (para 9-17-9)

Equipment Conditions: (para 9-17-9)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL L INBD LCHR AC CIRCUIT BREAKER (CB24) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF CHECK FOR OPEN BETWEEN: CB24-1 AND CB21-1 CB24-2 AND A77J2-3
NO
REPLACE CIRCUIT BREAKER CB24. TM 55-1520-238-23.
NO
OPEN CB24 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-3.
DOES SHORT EXIST?
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.
YES
DISCONNECT WIRE END AT CB24-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-3.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB24. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT HME SYSTEM.

END OF TASK

9-17-11. MSL L OUTBD LCHR AC CIRCUIT BREAKER (CB26) - DOES NOT STAY CLOSED OR CONTINUITY TO MISSILE LAUNCHER 1 DOES NOT EXIST BETWEEN A77J2-31 AND -2

Tools: (para 9-17-9)

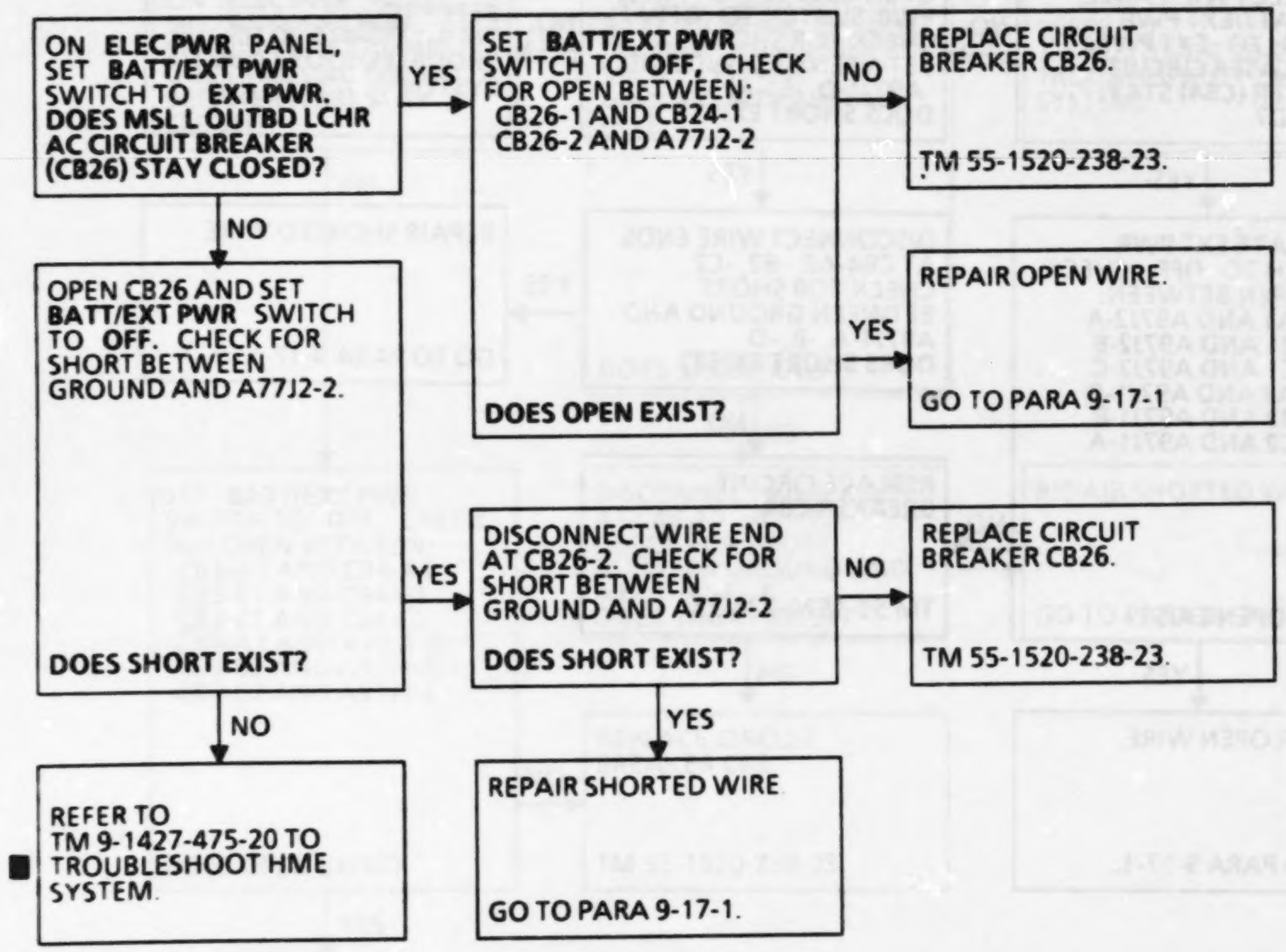
Personnel Required: (para 9-17-9)

References: (para 9-17-9)

Equipment Conditions: (para 9-17-9)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL L OUTBD LCHR AC CIRCUIT BREAKER (CB26) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB26-1 AND CB24-1 CB26-2 AND A77J2-2 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB26. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1
NO
OPEN CB26 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-2. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB26-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-2 DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB26. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT HME SYSTEM.

END OF TASK

9-17-12. FC FCC AC CIRCUIT BREAKER (CB16) - DOES NOT STAY CLOSED OR CONTINUITY TO FIRE CONTROL PANEL DOES NOT EXIST BETWEEN A77J2-30 AND -35

Tools: (para 9-17-9)

Personnel Required: (para 9-17-9)

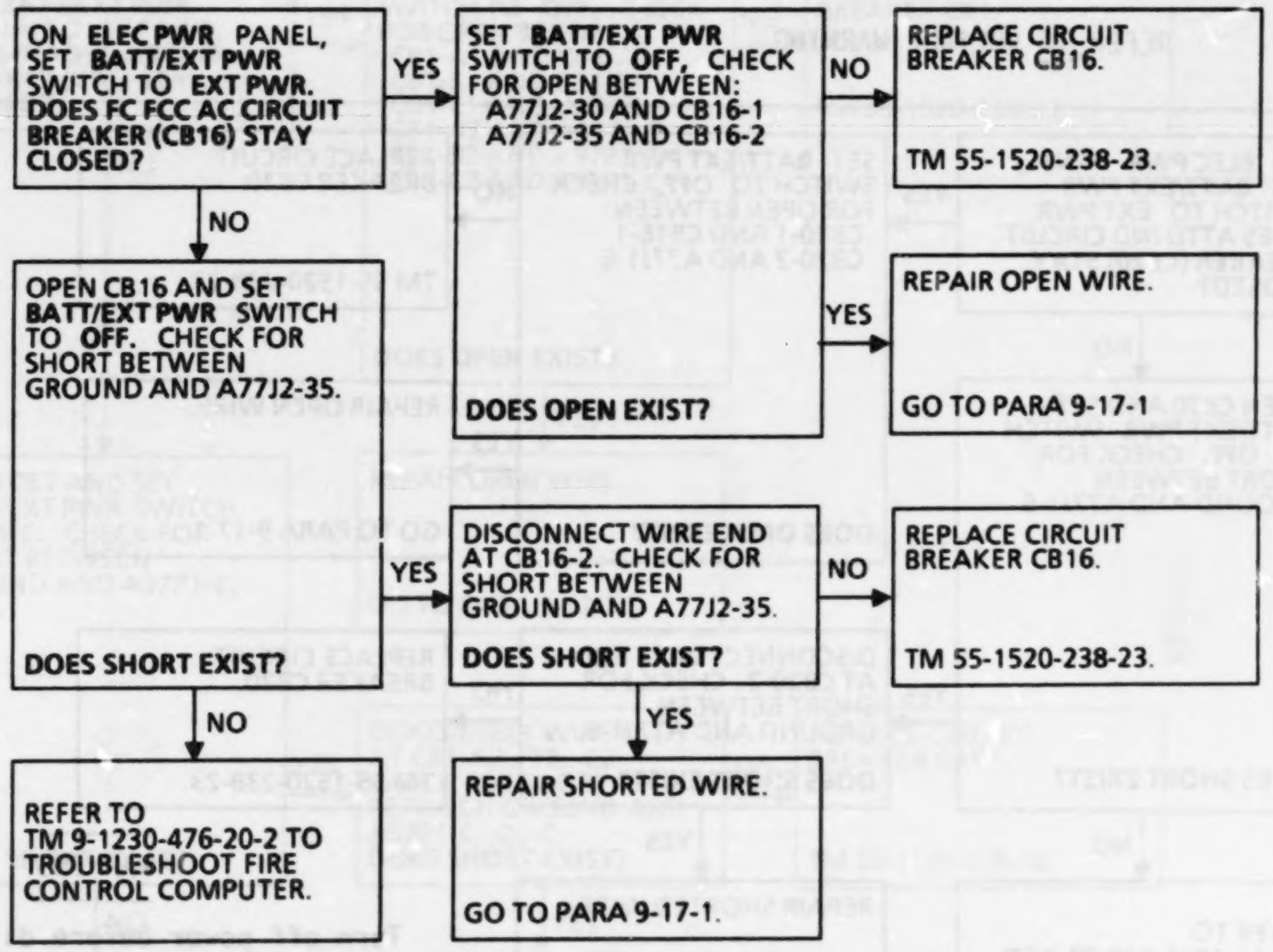
References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions: (para 9-17-9)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FC FCC AC CIRCUIT BREAKER (CB16) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: A77J2-30 AND CB16-1 A77J2-35 AND CB16-2 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB16. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1
NO
OPEN CB16 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-35. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB16-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-35. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB16. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT FIRE CONTROL COMPUTER.

END OF TASK

9-17-13. ATTD IND CIRCUIT BREAKER (CB20) - DOES NOT STAY CLOSED OR CONTINUITY TO REMOTE ATITUDE INDICATOR DOES NOT EXIST BETWEEN A77J2 -30 AND A77J1-6

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

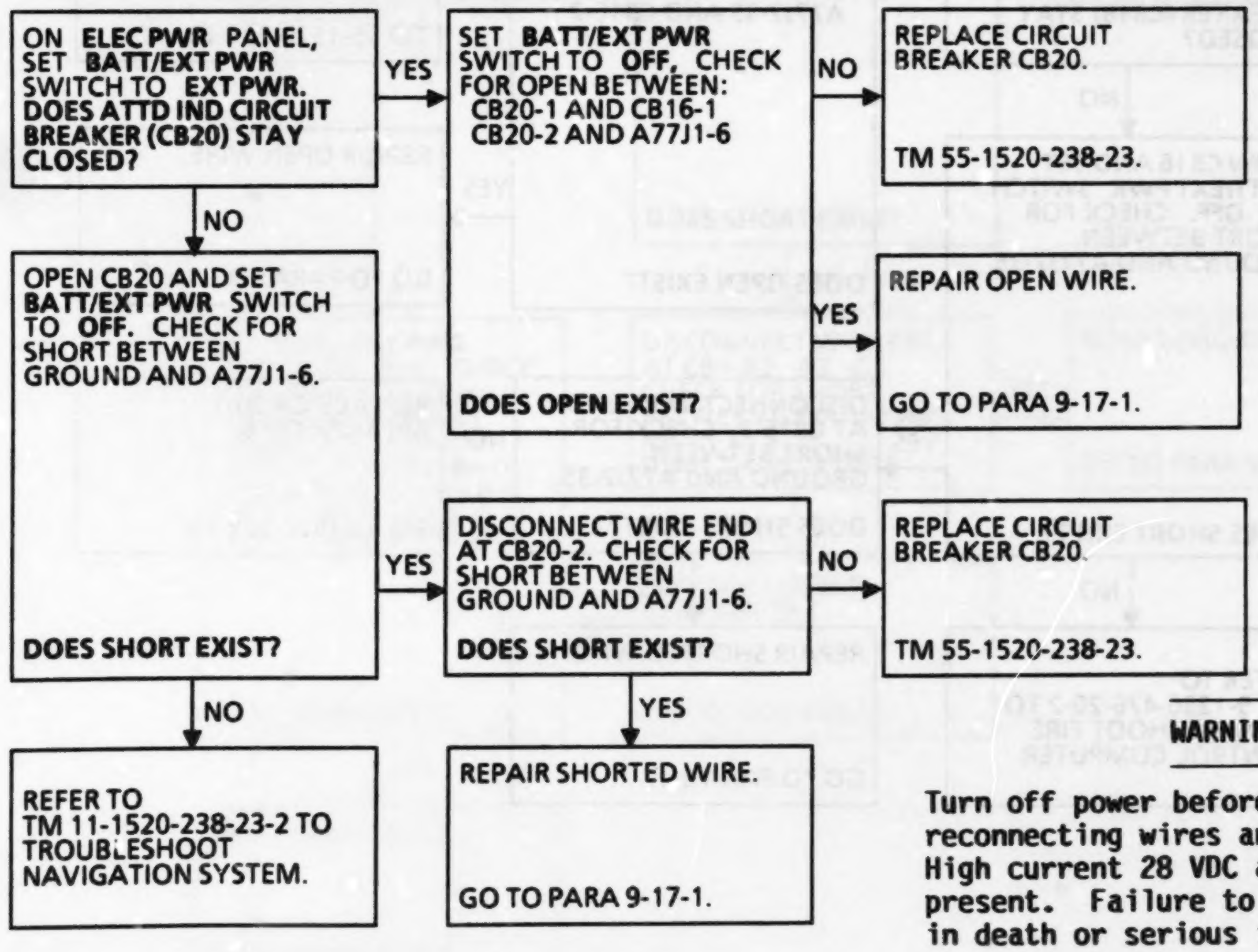
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ATTD IND CIRCUIT BREAKER (CB20) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB20-1 AND CB16-1 CB20-2 AND A77J1-6
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB20. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.
NO
OPEN CB20 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J1-6.
DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB20-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-6.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB20. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT NAVIGATION SYSTEM.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-17-14. LASER CIRCUIT BREAKER (CB4) - DOES NOT STAY CLOSED OR 115 VAC TO LASER ELECTRONIC UNIT IS NOT PRESENT AT A97J1-A, -B, -D

Tools: (para 9-17-13)

Personnel Required: (para 9-17-13)

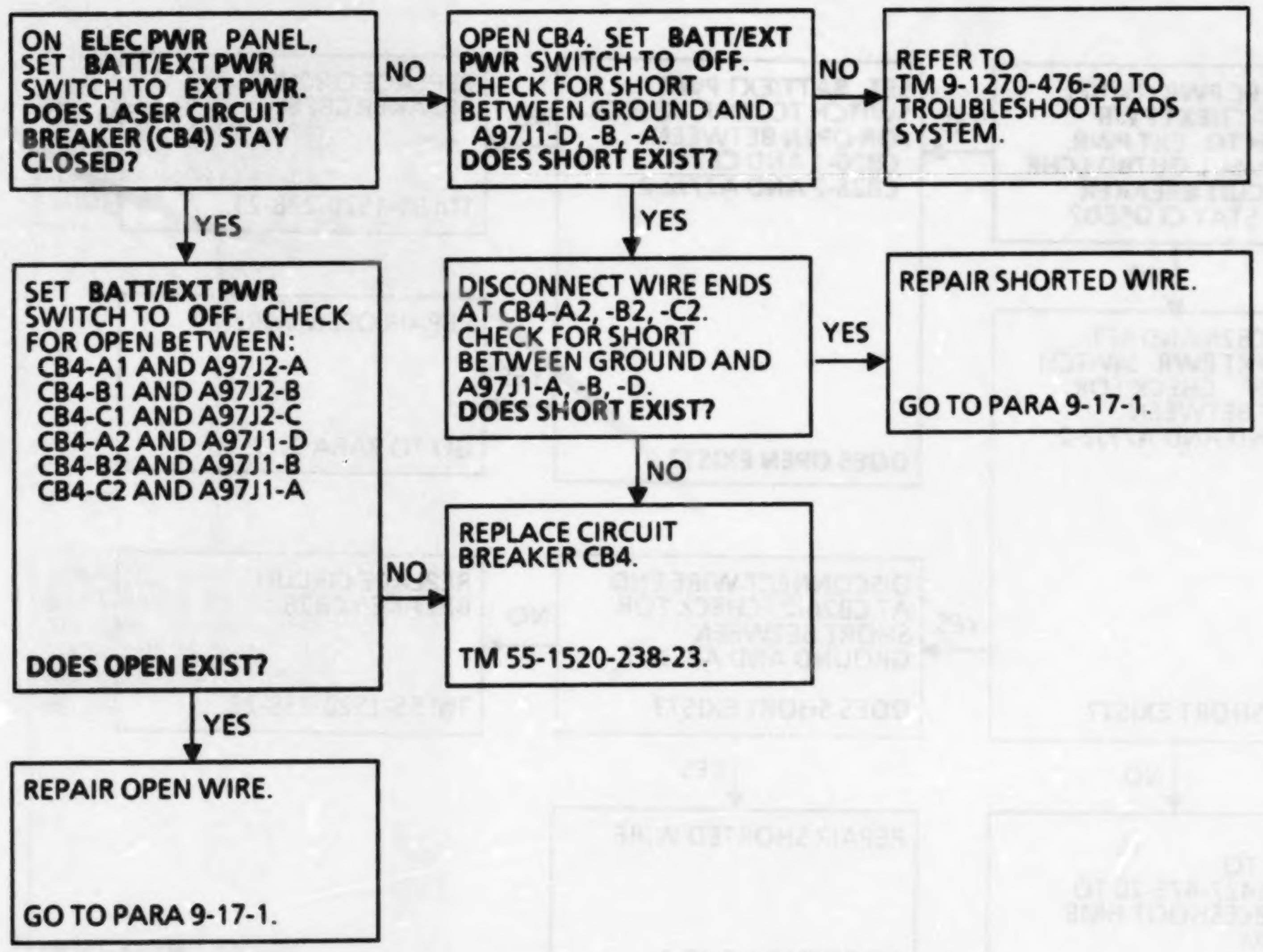
References:

TM 55-1520-238-23
TM 9-1270-476-20

Equipment Conditions: (para 9-17-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LASER CIRCUIT BREAKER (CB4) STAY CLOSED?
NO
OPEN CB4. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A97J1-D, -B, -A. DOES SHORT EXIST?
NO
REFER TO TM 9-1270-476-20 TO TROUBLESHOOT TADS SYSTEM.
YES
DISCONNECT WIRE ENDS AT CB4-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A97J1-A, -B, -D. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REPLACE CIRCUIT BREAKER CB4. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB4-A1 AND A97J2-A CB4-B1 AND A97J2-B CB4-C1 AND A97J2-C CB4-A2 AND A97J1-D CB4-B2 AND A97J1-B CB4-C2 AND A97J1-A
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.

END OF TASK

9-17-15. TADS AC CIRCUIT BREAKER (CB3) - DOES NOT STAY CLOSED OR 115 VAC TO TADS POWER SUPPLY AND ORT IS NOT PRESENT AT A97K1-H, -F, -E

Tools: (para 9-17-13)

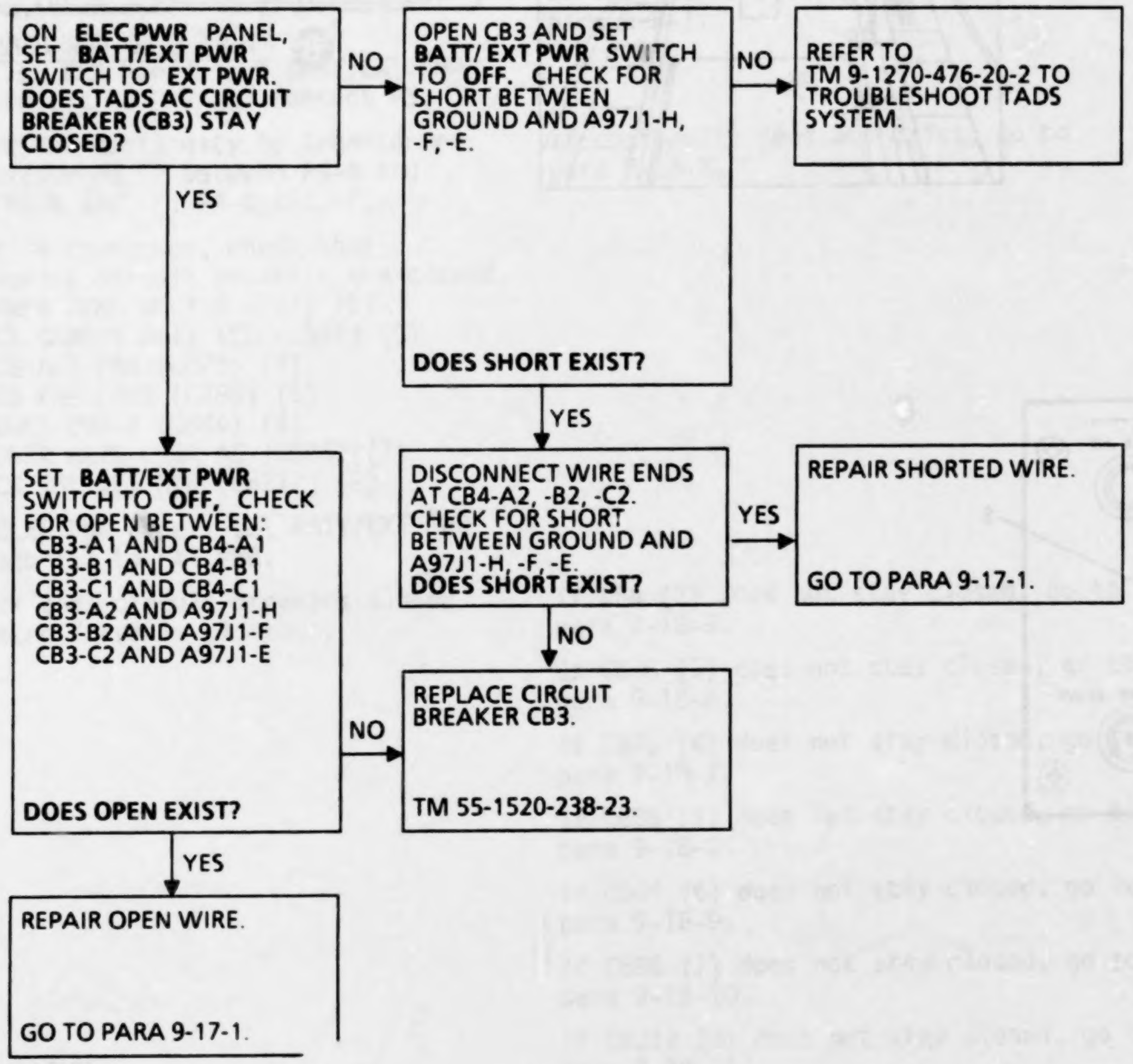
Personnel Required: (para 9-17-13)

References: (para 9-17-14)

Equipment Conditions: (para 9-17-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES TADS AC CIRCUIT BREAKER (CB3) STAY CLOSED?
NO
OPEN CB3 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A97J1-H, -F, -E.
DOES SHORT EXIST?
NO
REFER TO TM 9-1270-476-20-2 TO TROUBLESHOOT TADS SYSTEM.
YES
DISCONNECT WIRE ENDS AT CB4-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A97J1-H, -F, -E. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-17-1.
NO
REPLACE CIRCUIT BREAKER CB3.
TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN:
CB3-A1 AND CB4-A1
CB3-B1 AND CB4-B1
CB3-C1 AND CB4-C1
CB3-A2 AND A97J1-H
CB3-B2 AND A97J1-F
CB3-C2 AND A97J1-E
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-17-1.

END OF TASK

9-17-16. IHADSS CIRCUIT BREAKER (CB1) - DOES NOT STAY CLOSED OR 115 VAC TO IHADSS SEU IS NOT PRESENT AT A97P1-E, -D, -C

Tools: (para 9-17-13)

Personnel Required: (para 9-17-13)

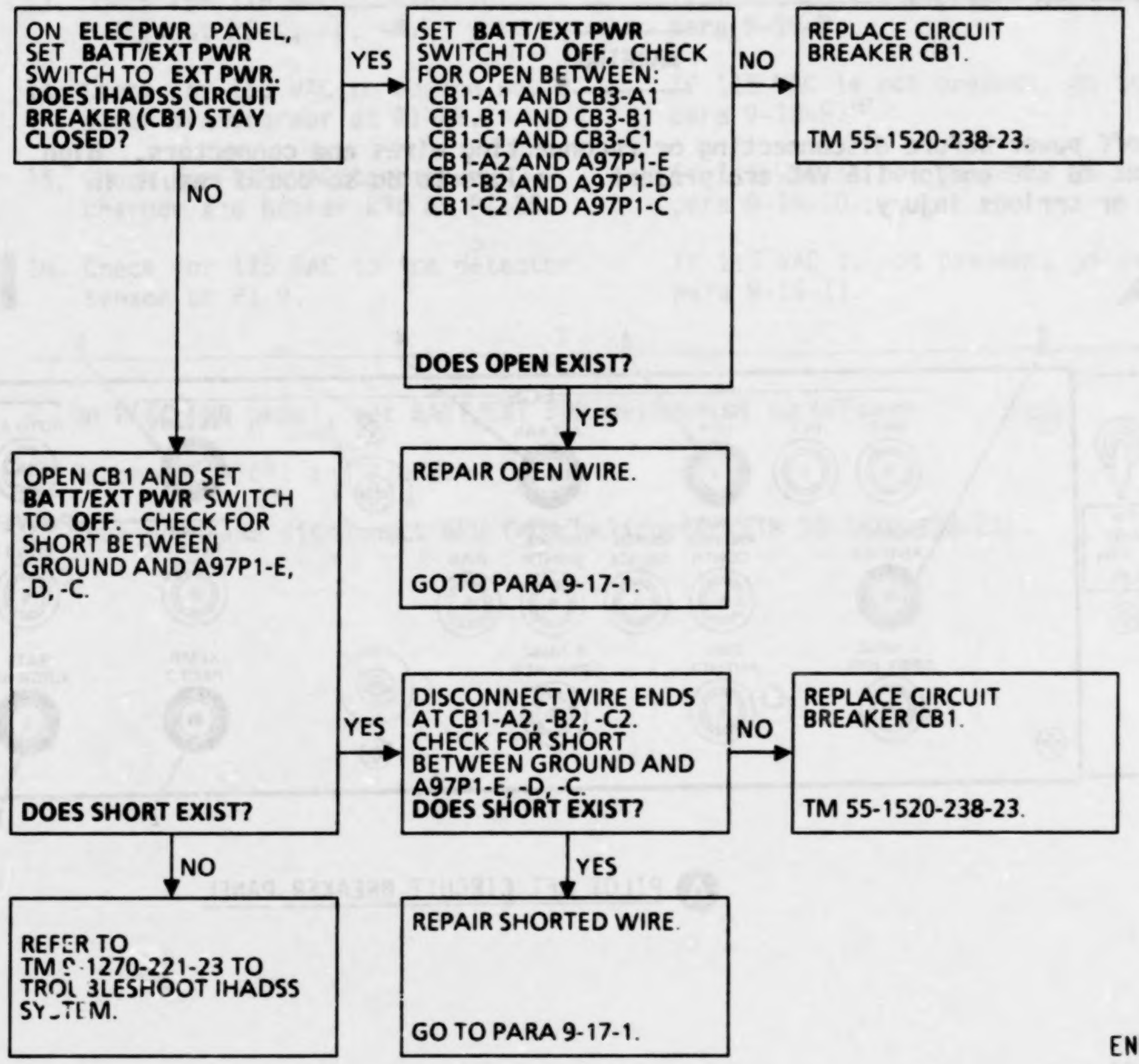
References:

TM 55-1520-238-23
TM 9-1270-221-23

Equipment Conditions: (para 9-17-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES IHADSS CIRCUIT BREAKER (CB1) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN:
CB1-A1 AND CB3-A1
CB1-B1 AND CB3-B1
CB1-C1 AND CB3-C1
CB1-A2 AND A97P1-E
CB1-B2 AND A97P1-D
CB1-C2 AND A97P1-C
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB1.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-17-1.
NO
OPEN CB1 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A97P1-E, -D, -C.
DOES SHORT EXIST?
YES
DISCONNECT WIRE ENDS AT CB1-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A97P1-E, -D, -C. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB1.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-17-1.
NO
REFER TO TM 9-1270-221-23 TO TROUBLESHOOT IHADSS SYSTEM.

END OF TASK

9-18-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

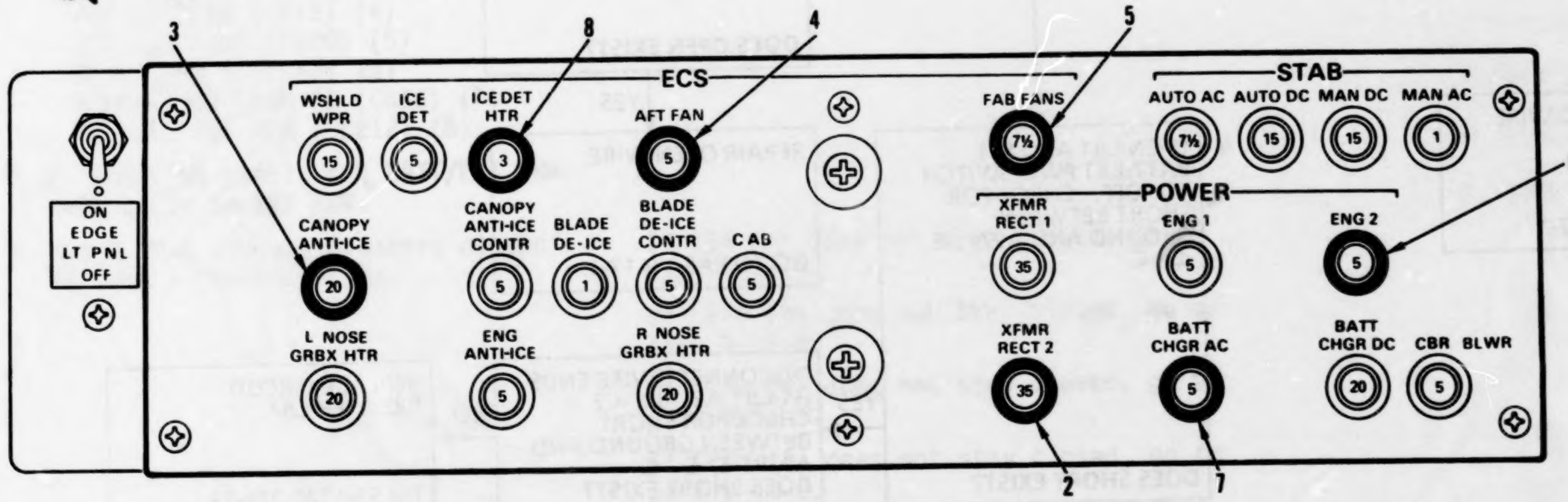
TM 55-1520-238-23

Equipment Conditions:

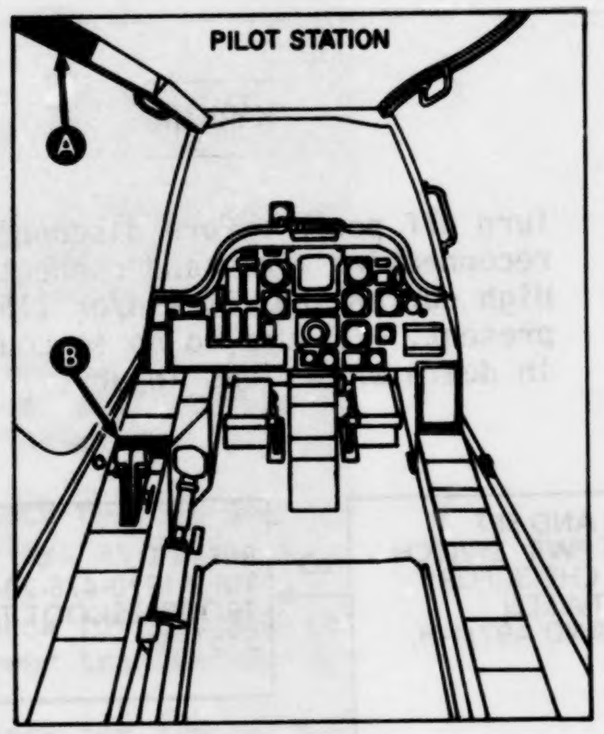
Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

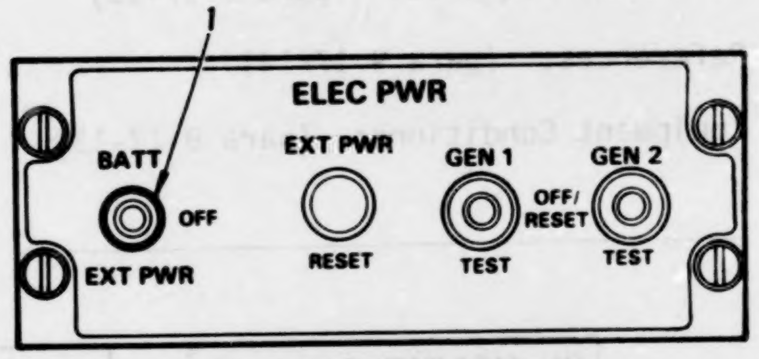
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


3
8
4
5
ECS
STAB
WSHLD WPR 15
ICE DET 5
ICE DET HTR 3
AFT FAN 5
FAB FANS 7½
AUTO AC 7½
AUTO DC 15
MAN DC 15
MAN AC 1
6
POWER
ON
EDGE
LT PNL
OFF
CANOPY ANTI-ICE 20
CANOPY ANTI-ICE CONTR 5
BLADE DE-ICE 1
BLADE DE-ICE CONTR 5
C AG 5
XFMR RECT 1 35
ENG 1 5
ENG 2 5
L NOSE GRBX HTR 20
ENG ANTI-ICE 5
R NOSE GRBX HTR 20
XFMR RECT 2 35
BATT CHGR AC 5
BATT CHGR DC 20
CBR BLWR 5
2
7

Ⓐ PILOT AFT CIRCUIT BREAKER PANEL


PILOT STATION
A
B


1
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
TEST
OFF/RESET
GEN 2
TEST

Ⓑ PILOT ELEC PWR PANEL

MM04/1-1008E

GO TO NEXT PAGE

9-18-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - PILOT STATION) OPERATIONAL CHECK (cont)

A. Disconnect A76P3 and A76P4.

B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P3-D, -E, -F; A76P4-A, -B, -C.	If short exists, go to para 9-18-4.
2. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
3. Check for 115 VAC at J3-D, -E, -F.	If 115 VAC is not present, go to para 9-2-1.
4. Check for 115 VAC at J4-A, -B, -C.	If 115 VAC is not present, go to para 9-2-1.
5. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF and connect P3.	
6. Check for continuity to transformer rectifier no. 2 between P4-A and -D, P4-B and -E, P4-C and -F.	If continuity does not exist, go to para 9-18-5.
7. With P4 connected, check that following circuit breakers are closed. POWER XFMR RECT 2 (CB4) (2) ECS CANOPY ANTI ICE (CB78) (3) ECS AFT FAN (CB75) (4) ECS FAB FANS (CB88) (5) POWER ENG 2 (CB44) (6) POWER BATT CHGR AC (CB86) (7) ECS ICE DET HTR (CB212) (8)	
8. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
9. Check that circuit breakers closed in step 7 remain closed.	If CB4 (2) does not stay closed, go to para 9-18-5. If CB78 (3) does not stay closed, go to para 9-18-6. If CB75 (4) does not stay closed, go to para 9-18-7. If CB88 (5) does not stay closed, go to para 9-18-8. If CB44 (6) does not stay closed, go to para 9-18-9. If CB86 (7) does not stay closed, go to para 9-18-10. If CB212 (8) does not stay closed, go to para 9-18-11.
10. With BATT/EXT PWR switch (1) set to OFF, disconnect A76P1 and A76P2.	
11. With BATT/EXT PWR switch (1) set to EXT PWR, check for 115 VAC to canopy temperature control at P2-c, -d, -e.	If 115 VAC is not present, go to para 9-18-6.
12. Check for 115 VAC to electrical power distribution box and aft avionics bay fans at P2-A, -B, -C.	If 115 VAC is not present, go to para 9-18-7.
13. Check for 115 VAC to FAB fan relays at P2-K, -L, -M.	If 115 VAC is not present, go to para 9-18-8.
14. Check for 115 VAC to engine no. 2 power transformer at P1-23.	If 115 VAC is not present, go to para 9-18-9.
15. Check for 115 VAC to battery charger and heater kit at P1-35.	If 115 VAC is not present, go to para 9-18-10.
16. Check for 115 VAC to ice detector sensor at P1-9.	If 115 VAC is not present, go to para 9-18-11.

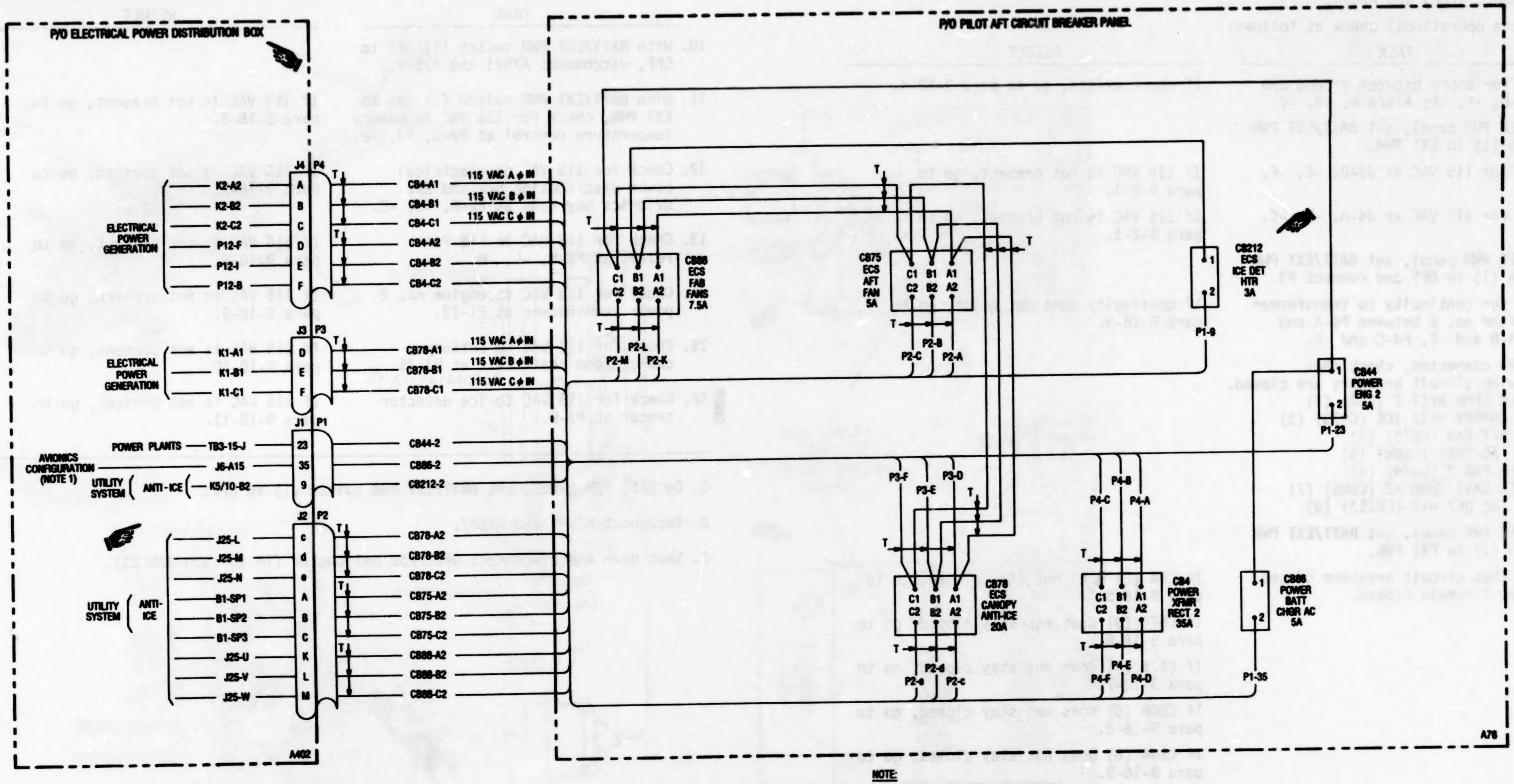
C. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.

D. Reconnect A76P1 and A76P2.

E. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-18-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - PILOT STATION) - INTERCONNECTION DIAGRAM

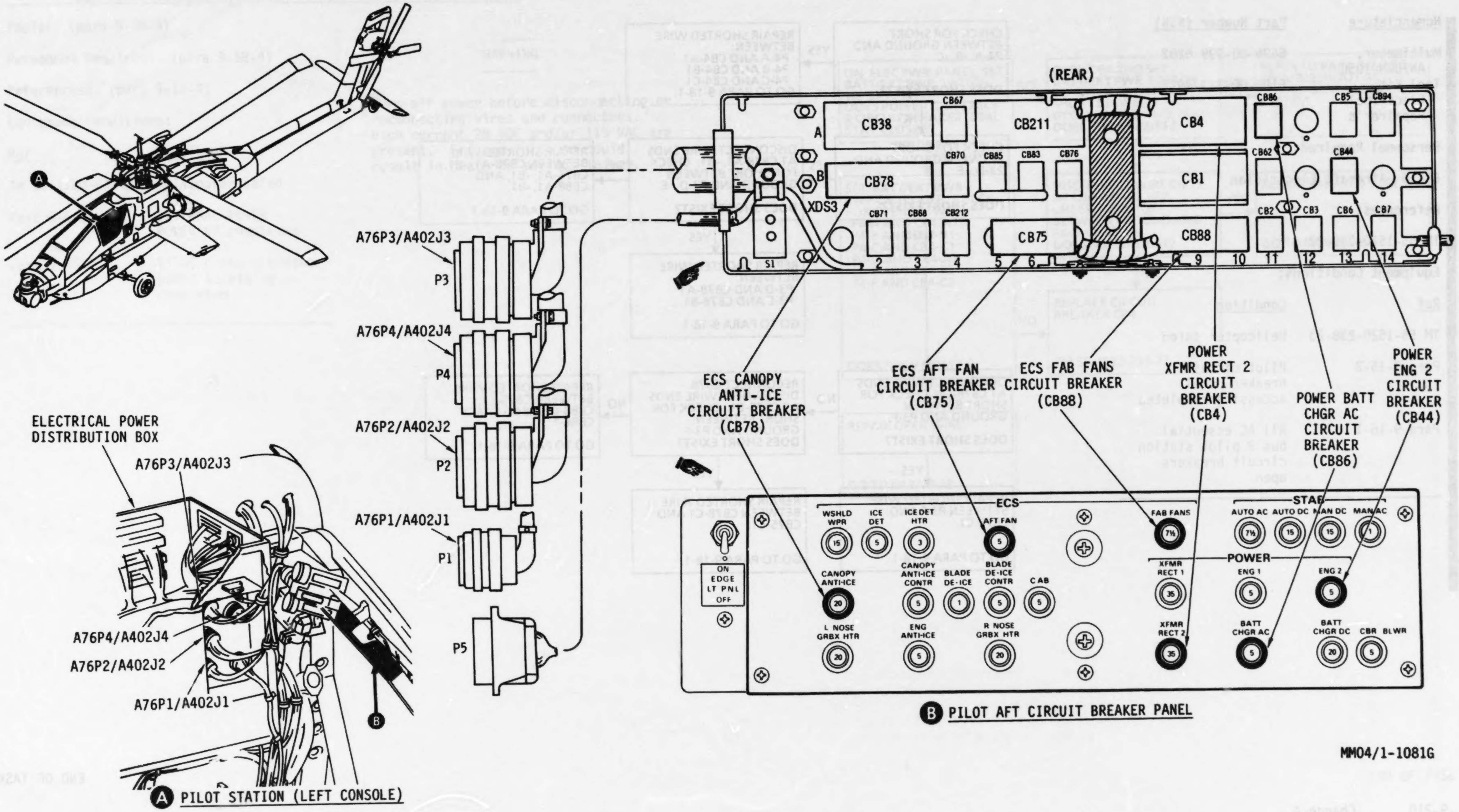

P/O ELECTRICAL POWER DISTRIBUTION BOX
J4 P4
ELECTRICAL POWER GENERATION
K2-A2
K2-B2
K2-C2
P12-F
P12-I
P12-B
A
B
C
D
E
F
T
CB4-A1
CB4-B1
CB4-C1
CB4-A2
CB4-B2
CB4-C2
115 VAC A ϕ IN
115 VAC B ϕ IN
115 VAC C ϕ IN
J3 P3
ELECTRICAL POWER GENERATION
K1-A1
K1-B1
K1-C1
CB78-A1
CB78-B1
CB78-C1
J1 P1
POWER PLANTS
TB3-15-J
AVIONICS CONFIGURATION (NOTE 1)
J6-A15
UTILITY SYSTEM
ANTI-ICE
K5/10-B2
23
35
9
CB44-2
CB86-2
CB212-2
J2 P2
J25-L
J25-M
J25-N
B1-SP1
B1-SP2
B1-SP3
J25-U
J25-V
J25-W
c
d
e
K
L
M
CB78-A2
CB78-B2
CB78-C2
CB75-A2
CB75-B2
CB75-C2
CB88-A2
CB88-B2
CB88-C2
A402
P/O PILOT AFT CIRCUIT BREAKER PANEL
CB88 ECS FAB FANS 7.5A
C1 B1 A1
C2 B2 A2
P2-M
P2-L
P2-K
CB75 ECS AFT FAN 5A
P2-B
P2-C
P2-A
CB212 ECS ICE DET HTR 3A
1
2
P1-9
CB44 POWER ENG 2 5A
P1-23
P3-F
P3-E
P3-D
CB78 ECS CANOPY ANTI-ICE 20A
P2-d
P2-e
P2-c
P4-B
P4-C
P4-A
CB4 POWER XFMR RECT 2 35A
P4-E
P4-F
P4-D
CB86 POWER BATT CHGR AC 5A
P1-35
A76

NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-759D

9-18-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
A76P3/A402J3
P3
A76P4/A402J4
P4
A76P2/A402J2
P2
A76P1/A402J1
P1
P5
ELECTRICAL POWER DISTRIBUTION BOX
A76P3/A402J3
A76P4/A402J4
A76P2/A402J2
A76P1/A402J1
B
(REAR)
A
B
CB38
CB67
CB211
CB4
CB86
CB5
CB94
CB70
CB85
CB83
CB76
CB78
CB1
CB62
CB44
XDS3
CB71
CB68
CB212
CB75
CB88
CB2
CB3
CB6
CB7
S1
2
3
4
5
6
9
10
11
12
13
14
ECS CANOPY ANTI-ICE CIRCUIT BREAKER (CB78)
ECS AFT FAN CIRCUIT BREAKER (CB75)
ECS FAB FANS CIRCUIT BREAKER (CB88)
POWER XFMR RECT 2 CIRCUIT BREAKER (CB4)
POWER BATT CHGR AC CIRCUIT BREAKER (CB86)
POWER ENG 2 CIRCUIT BREAKER (CB44)
ON
EDGE
LT PNL
OFF
ECS
WSHLD WPR
15
ICE DET
5
ICE DET HTR
3
AFT FAN
5
CANOPY ANTI-ICE
20
CANOPY ANTI-ICE CONTR
5
BLADE DE-ICE
1
BLADE DE-ICE CONTR
5
C AB
5
L NOSE GRBX HTR
20
ENG ANTI-ICE
5
R NOSE GRBX HTR
20
FAB FANS
7½
STAB
AUTO AC
7½
AUTO DC
15
MAN DC
15
MAN AC
1
POWER
XFMR RECT 1
35
ENG 1
5
ENG 2
5
XFMR RECT 2
35
BATT CHGR AC
5
BATT CHGR DC
20
CBR BLWR
5

Ⓐ PILOT STATION (LEFT CONSOLE)

Ⓑ PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1081G

9-18-4. A SHORT EXISTS BETWEEN GROUND AND A76P3-D, -E, -F OR A76P4-A, -B, -C

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

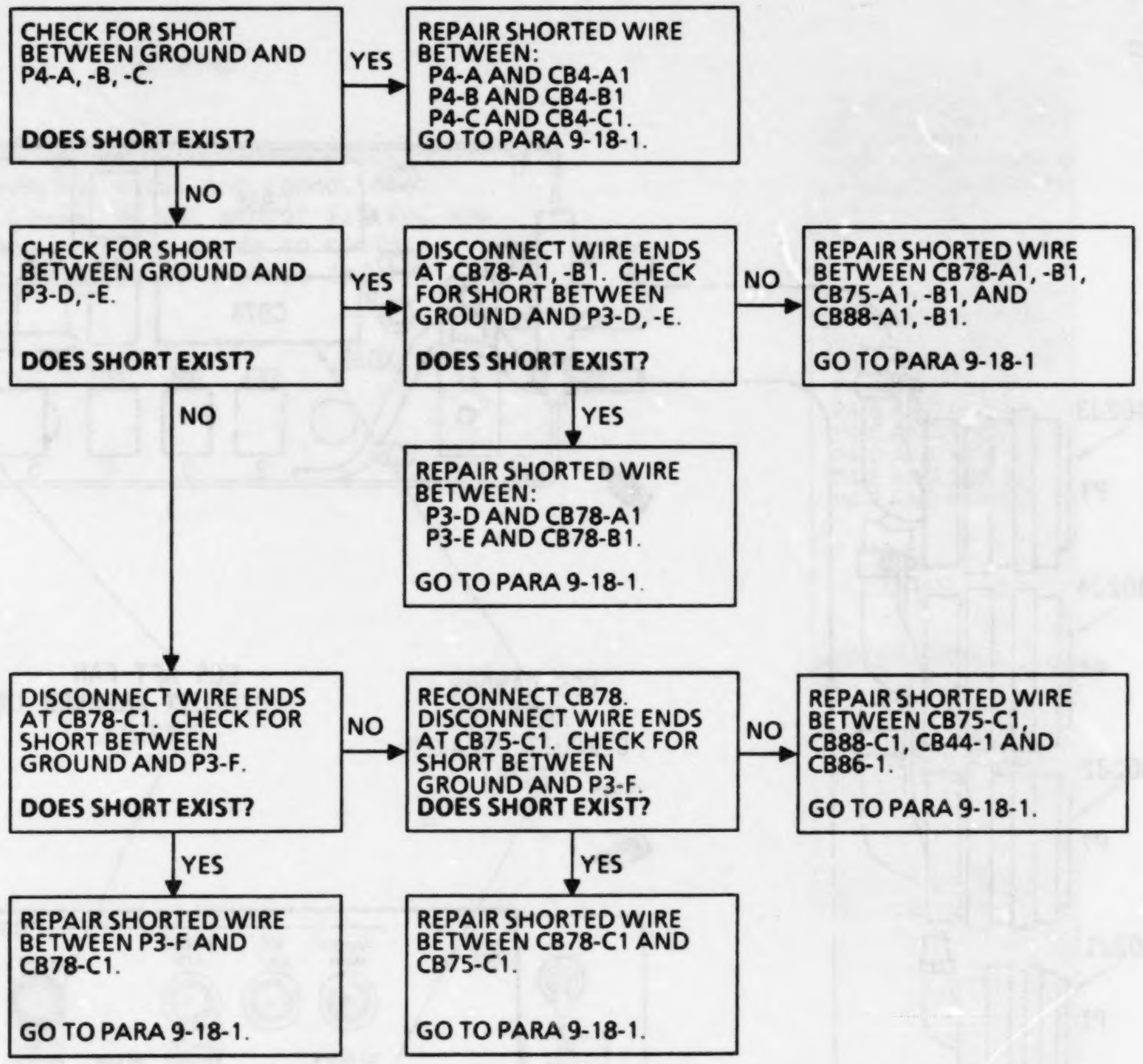
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-16-1	All AC essential bus 2 pilot station circuit breakers open



CHECK FOR SHORT BETWEEN GROUND AND P4-A, -B, -C.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN:
P4-A AND CB4-A1
P4-B AND CB4-B1
P4-C AND CB4-C1.
GO TO PARA 9-18-1.

CHECK FOR SHORT BETWEEN GROUND AND P3-D, -E.

DOES SHORT EXIST?

DISCONNECT WIRE ENDS AT CB78-A1, -B1. CHECK FOR SHORT BETWEEN GROUND AND P3-D, -E.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB78-A1, -B1, CB75-A1, -B1, AND CB88-A1, -B1.

GO TO PARA 9-18-1

REPAIR SHORTED WIRE BETWEEN:
P3-D AND CB78-A1
P3-E AND CB78-B1.

GO TO PARA 9-18-1.

DISCONNECT WIRE ENDS AT CB78-C1. CHECK FOR SHORT BETWEEN GROUND AND P3-F.

DOES SHORT EXIST?

RECONNECT CB78. DISCONNECT WIRE ENDS AT CB75-C1. CHECK FOR SHORT BETWEEN GROUND AND P3-F.
DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB75-C1, CB88-C1, CB44-1 AND CB86-1.

GO TO PARA 9-18-1.

REPAIR SHORTED WIRE BETWEEN P3-F AND CB78-C1.

GO TO PARA 9-18-1.

REPAIR SHORTED WIRE BETWEEN CB78-C1 AND CB75-C1.

GO TO PARA 9-18-1.

END OF TASK

9-18-5. POWER XFMR RECT 2 CIRCUIT BREAKER (CB4) - DOES NOT STAY CLOSED OR CONTINUITY TO TRANSFORMER RECTIFIER NO. 2 DOES NOT EXIST BETWEEN P4-A AND -D; -B AND -E; -C AND -F

Tools: (para 9-18-4)

Personnel Required: (para 9-18-4)

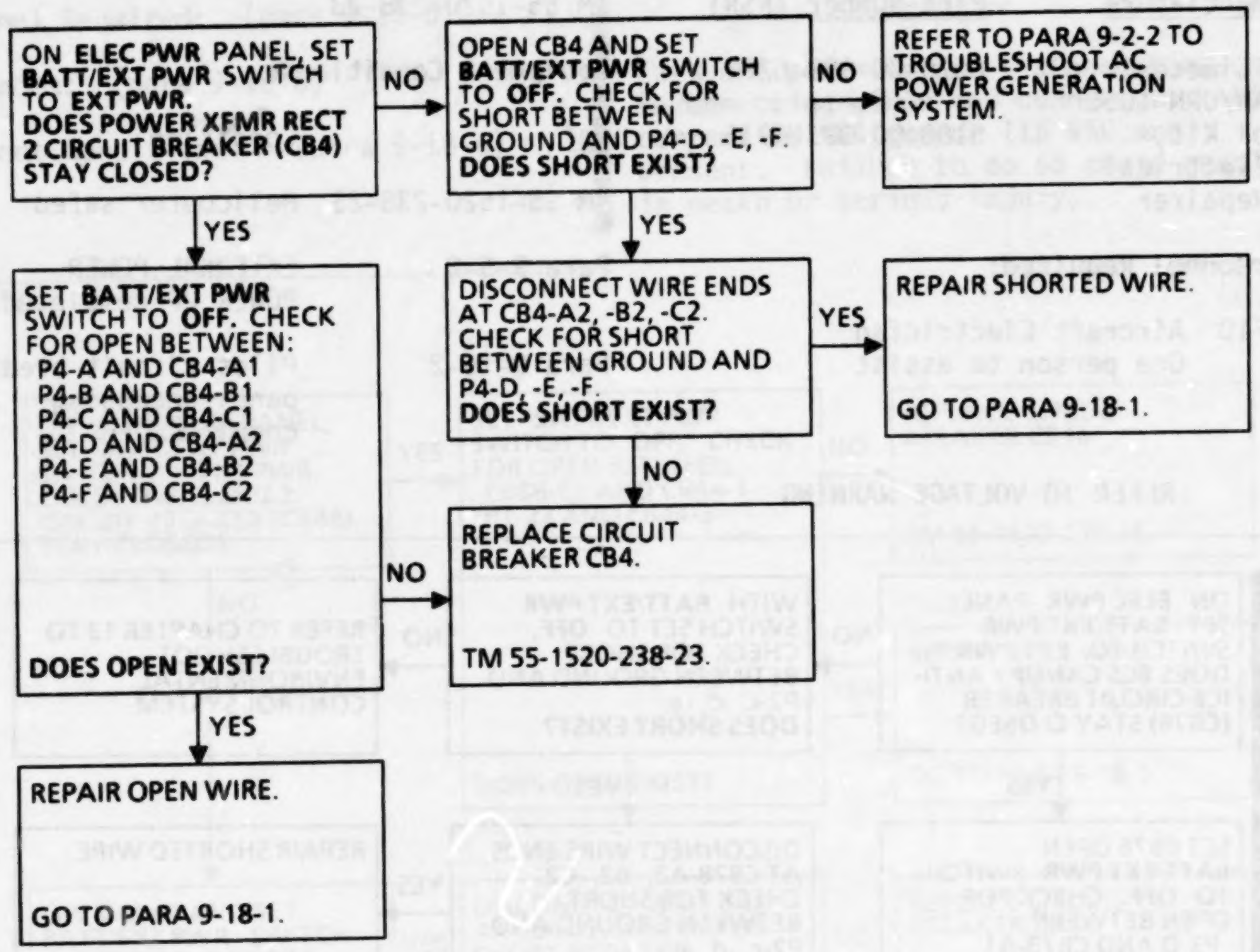
References: (para 9-18-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES POWER XFMR RECT 2 CIRCUIT BREAKER (CB4) STAY CLOSED?

OPEN CB4 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P4-D, -E, -F. DOES SHORT EXIST?

REFER TO PARA 9-2-2 TO TROUBLESHOOT AC POWER GENERATION SYSTEM.

SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
P4-A AND CB4-A1
P4-B AND CB4-B1
P4-C AND CB4-C1
P4-D AND CB4-A2
P4-E AND CB4-B2
P4-F AND CB4-C2
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB4-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P4-D, -E, -F. DOES SHORT EXIST?

REPAIR SHORTED WIRE.
GO TO PARA 9-18-1.

REPLACE CIRCUIT BREAKER CB4.
TM 55-1520-238-23.

REPAIR OPEN WIRE.
GO TO PARA 9-18-1.

END OF TASK

9-18-6. ECS CANOPY ANTI ICE CIRCUIT BREAKER (CB78) - DOES NOT STAY CLOSED OR 115 VAC TO CANOPY TEMPERATURE CONTROL IS NOT PRESENT AT P2-c, -d, -e

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

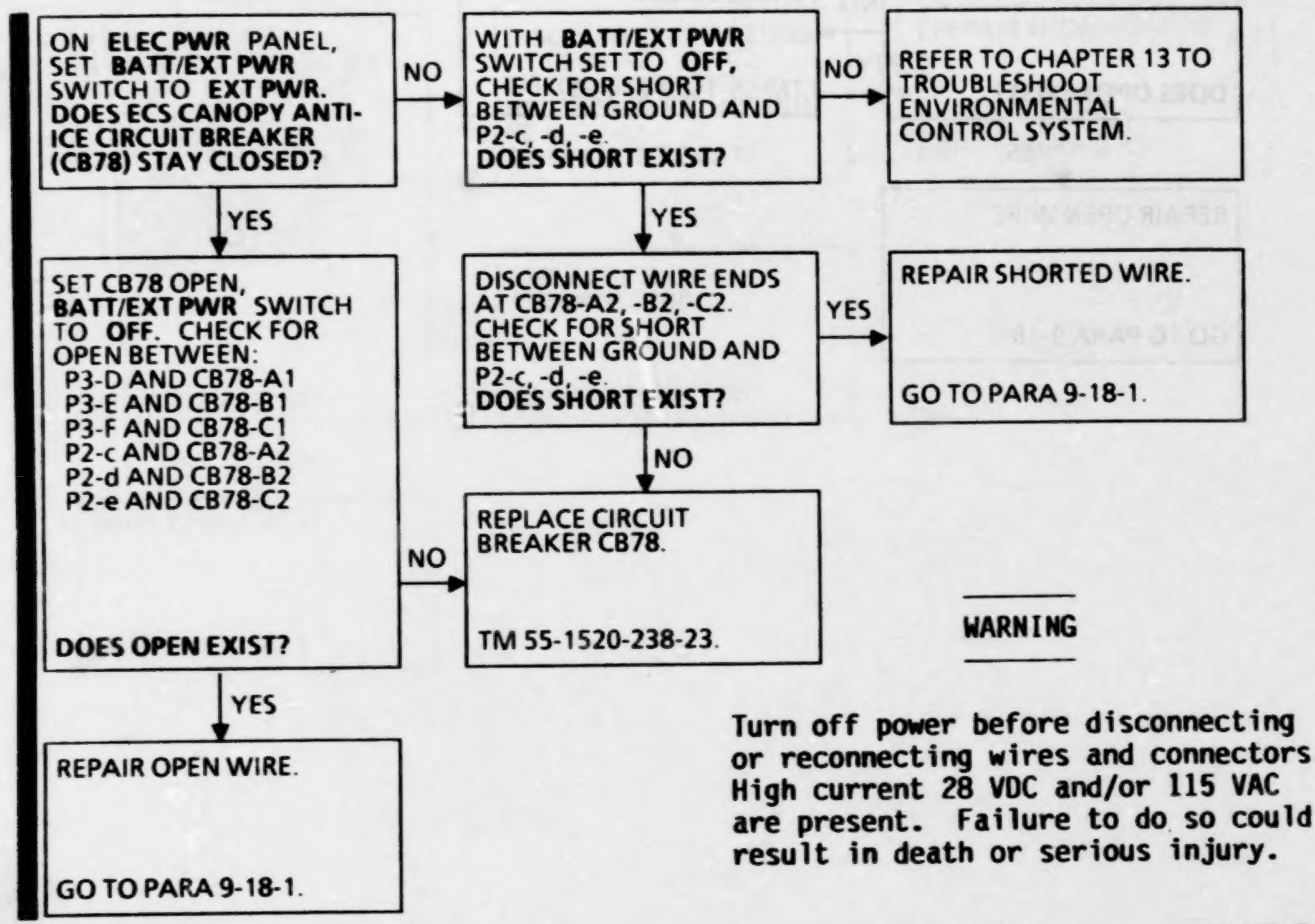
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS CANOPY ANTI-ICE CIRCUIT BREAKER (CB78) STAY CLOSED?
NO
WITH BATT/EXT PWR SWITCH SET TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P2-c, -d, -e. DOES SHORT EXIST?
NO
REFER TO CHAPTER 13 TO TROUBLESHOOT ENVIRONMENTAL CONTROL SYSTEM.
YES
YES
SET CB78 OPEN, BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: P3-D AND CB78-A1 P3-E AND CB78-B1 P3-F AND CB78-C1 P2-c AND CB78-A2 P2-d AND CB78-B2 P2-e AND CB78-C2 DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB78-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P2-c, -d, -e. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-18-1.
NO
NO
REPLACE CIRCUIT BREAKER CB78. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-18-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-18-7. ECS AFT FANS CIRCUIT BREAKER (CB75) - DOES NOT STAY CLOSED OR 115 VAC TO ELECTRICAL POWER CENTER AND AFT AVIONICS FANS IS NOT PRESENT AT P2-A, -B, -C

Tools: (para 9-18-6)

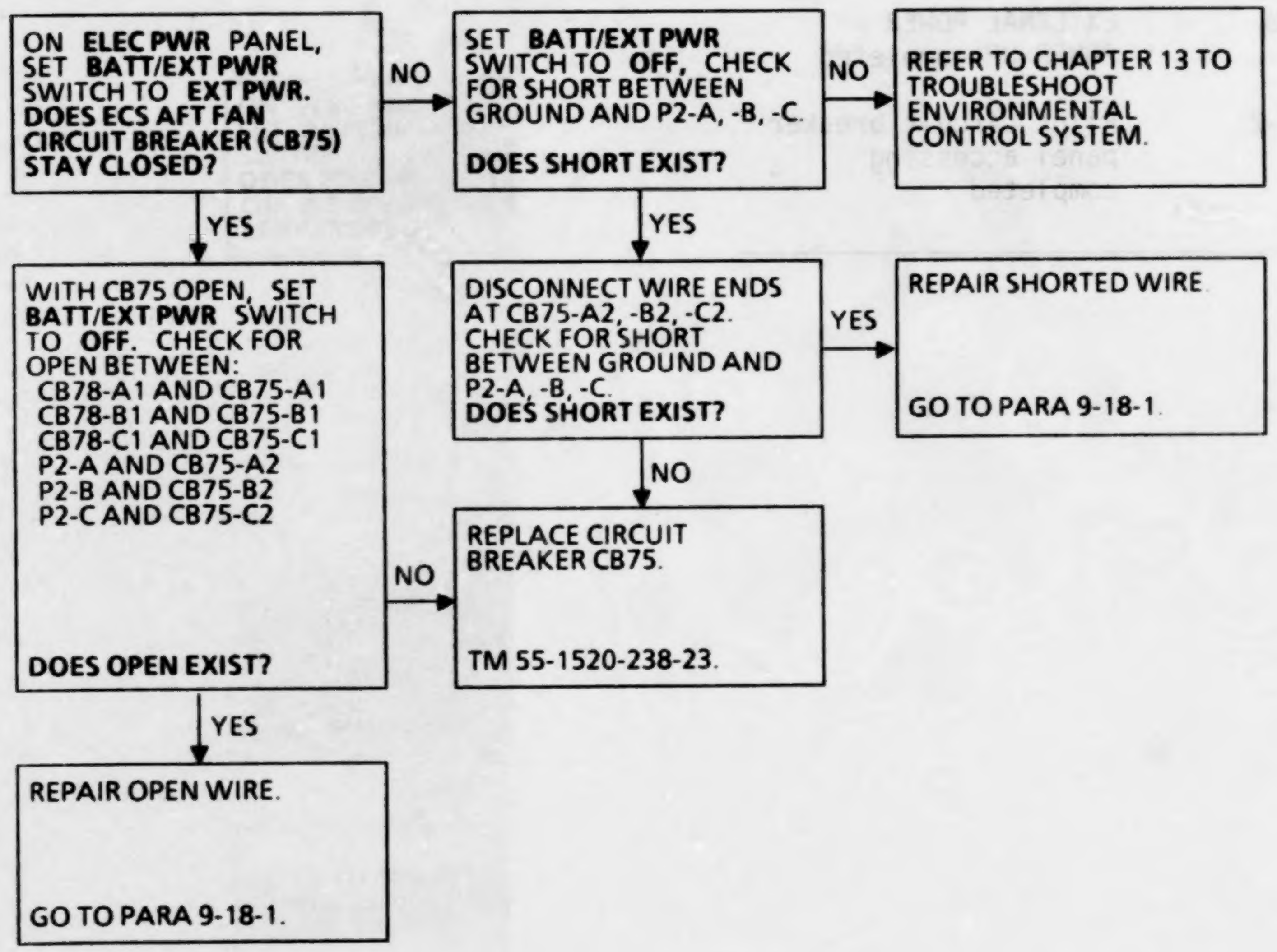
Personnel Required: (para 9-18-6)

References: (para 9-18-6)

Equipment Conditions: (para 9-18-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS AFT FAN CIRCUIT BREAKER (CB75) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P2-A, -B, -C. DOES SHORT EXIST?
NO
REFER TO CHAPTER 13 TO TROUBLESHOOT ENVIRONMENTAL CONTROL SYSTEM.
YES
YES
WITH CB75 OPEN, SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB78-A1 AND CB75-A1 CB78-B1 AND CB75-B1 CB78-C1 AND CB75-C1 P2-A AND CB75-A2 P2-B AND CB75-B2 P2-C AND CB75-C2 DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB75-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P2-A, -B, -C. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-18-1.
NO
NO
REPLACE CIRCUIT BREAKER CB75. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-18-1.

END OF TASK

9-18-8. ECS FAB FANS CIRCUIT BREAKER (CB88) - DOES NOT STAY CLOSED OR 115 VAC TO FAB FAN RELAYS IS NOT PRESENT AT P2-K, -L, -M

Tools: (para 9-18-6)

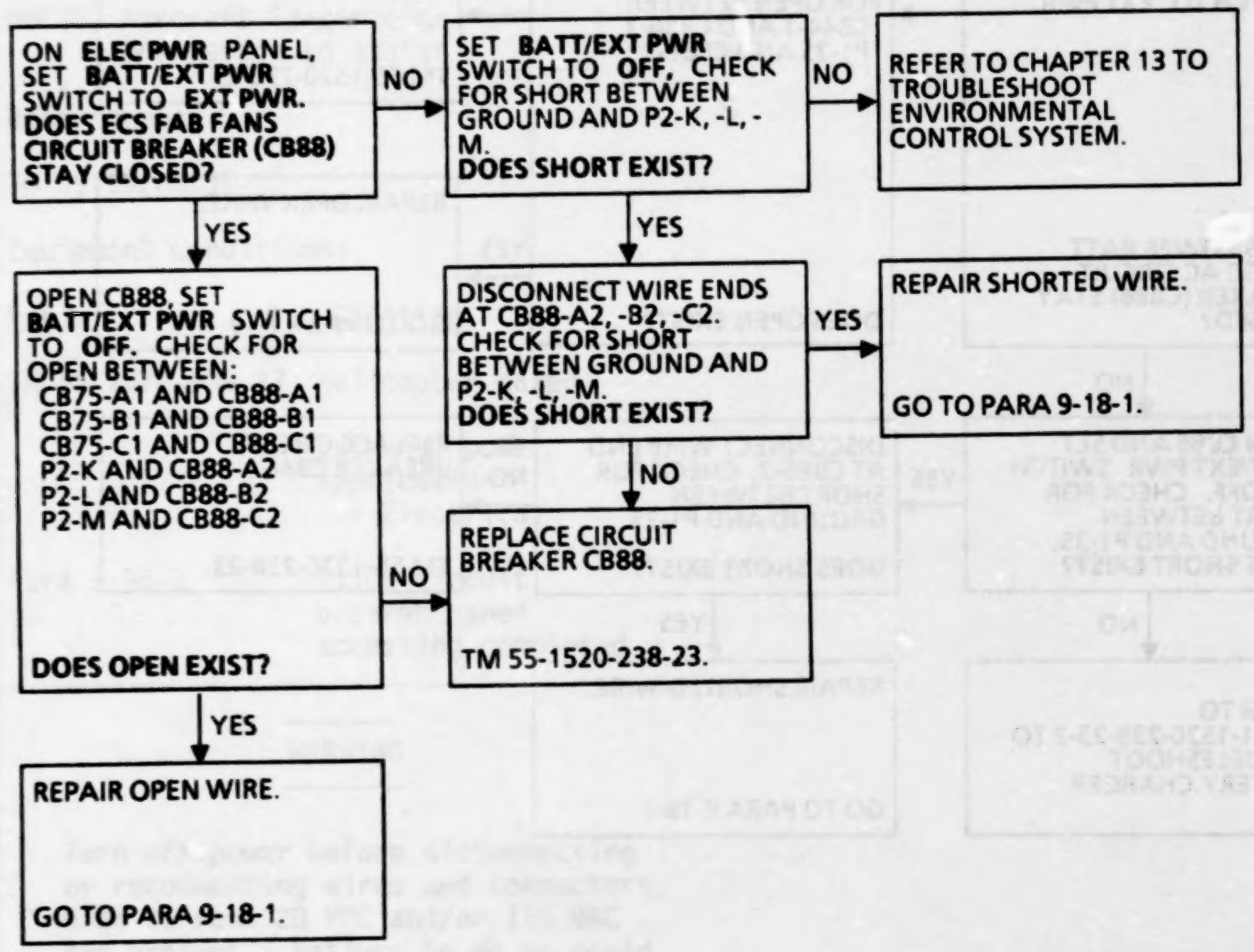
Personnel Required: (para 9-18-6)

References: (para 9-18-6)

Equipment Conditions: (para 9-18-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS FAB FANS CIRCUIT BREAKER (CB88) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P2-K, -L, -M. DOES SHORT EXIST?
NO
REFER TO CHAPTER 13 TO TROUBLESHOOT ENVIRONMENTAL CONTROL SYSTEM.
YES
YES
OPEN CB88, SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB75-A1 AND CB88-A1 CB75-B1 AND CB88-B1 CB75-C1 AND CB88-C1 P2-K AND CB88-A2 P2-L AND CB88-B2 P2-M AND CB88-C2 DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB88-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P2-K, -L, -M. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-18-1.
NO
NO
REPLACE CIRCUIT BREAKER CB88. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-18-1.

END OF TASK

9-18-9. POWER ENG 2 CIRCUIT BREAKER (CB44) - DOES NOT STAY CLOSED OR 115 VAC TO ENGINE NO. 2 POWER TRANSFORMER IS NOT PRESENT AT P1-23

Tools: (para 9-18-6)

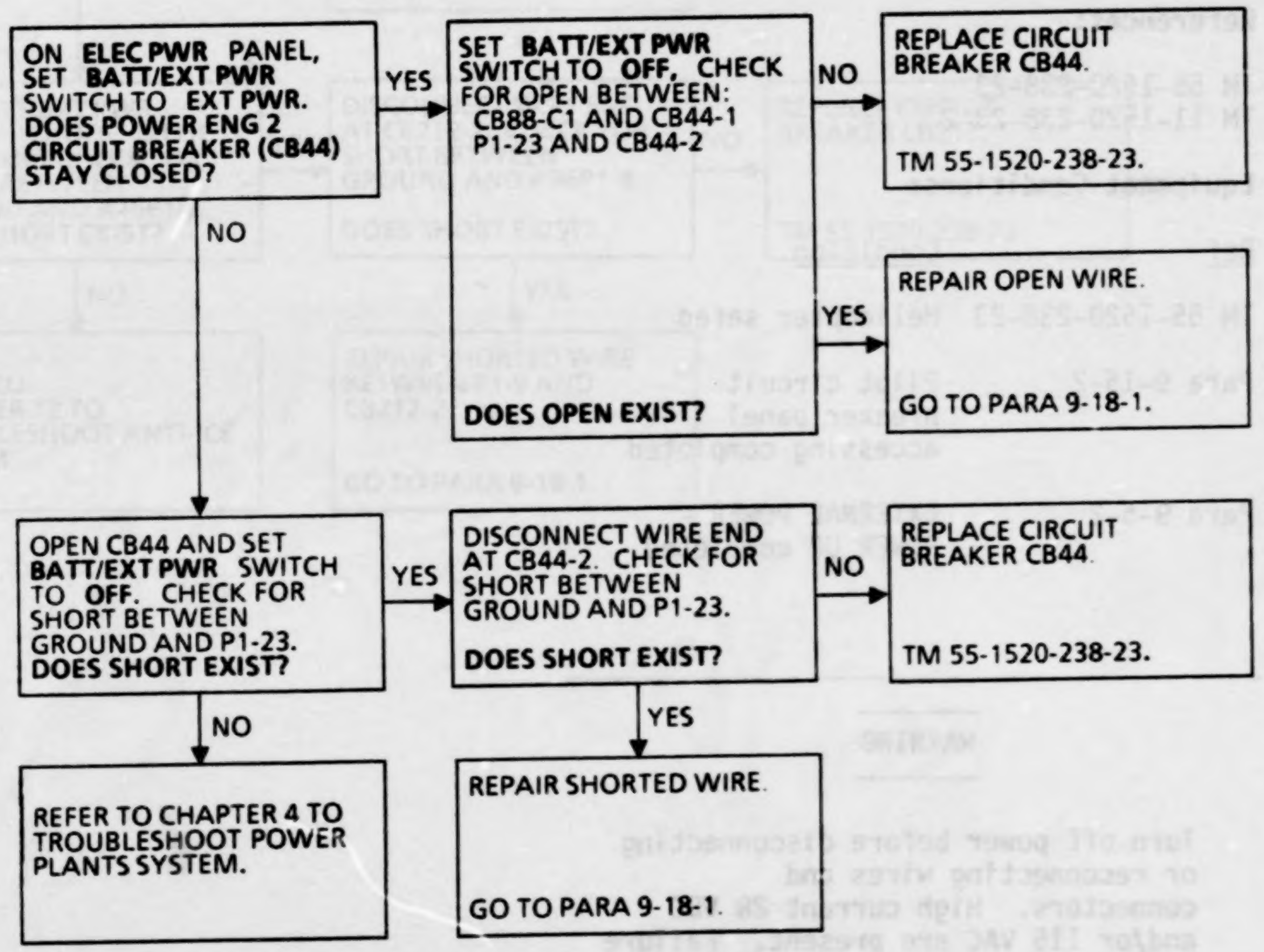
Personnel Required: (para 9-18-6)

References: (para 9-18-6)

Equipment Conditions: (para 9-18-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES POWER ENG 2 CIRCUIT BREAKER (CB44) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB88-C1 AND CB44-1 P1-23 AND CB44-2 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB44. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-18-1.
NO
OPEN CB44 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-23. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB44-2. CHECK FOR SHORT BETWEEN GROUND AND P1-23. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB44. TM 55-1520-238-23.
NO
REFER TO CHAPTER 4 TO TROUBLESHOOT POWER PLANTS SYSTEM.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-18-1.

END OF TASK

9-18-10. POWER BATT CHRGR AC CIRCUIT BREAKER (CB86) - DOES NOT STAY CLOSED OR 115 VAC TO BATTERY CHARGER AND HEATER IS NOT PRESENT AT P1-35

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

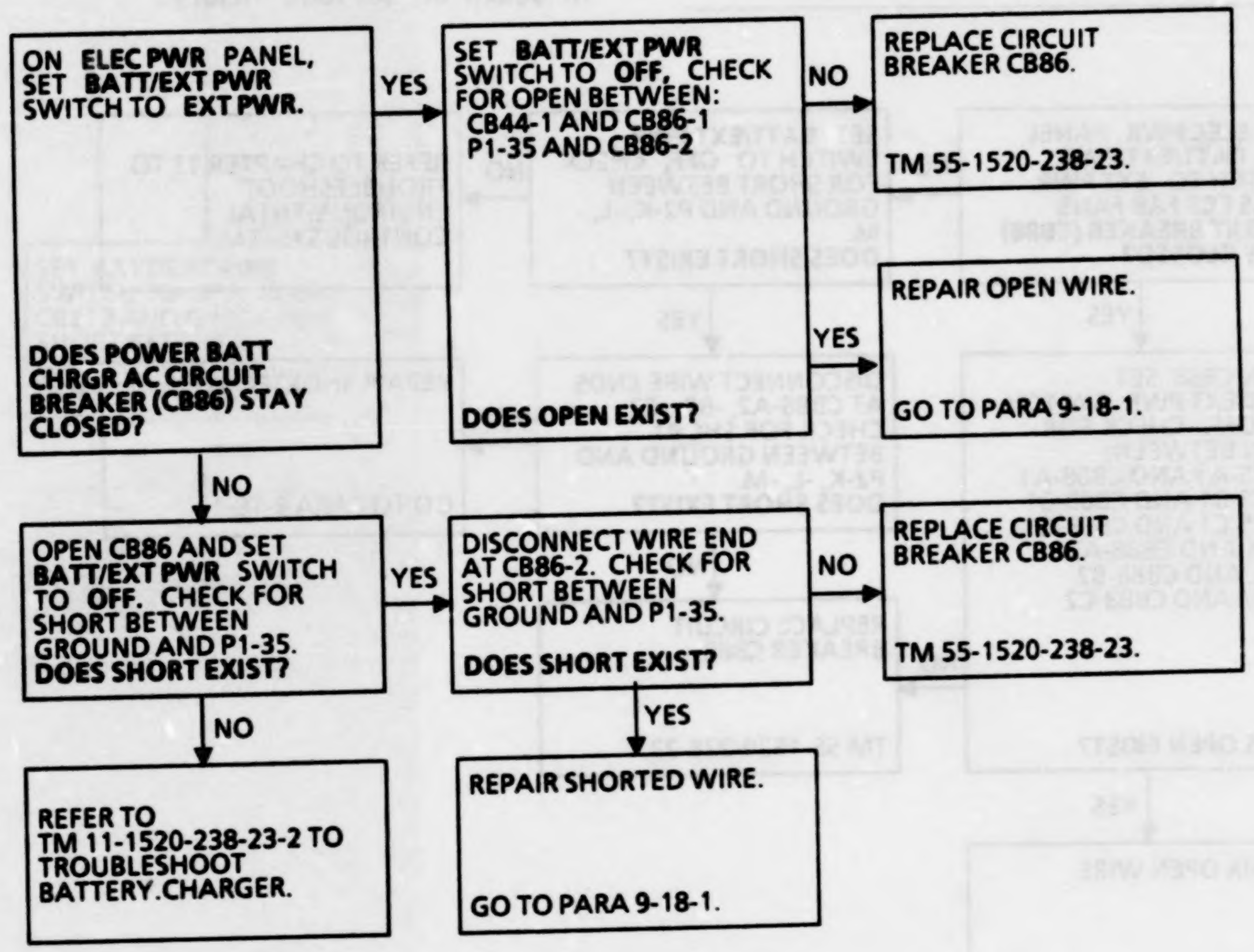
TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR.
DOES POWER BATT CHRGR AC CIRCUIT BREAKER (CB86) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB44-1 AND CB86-1 P1-35 AND CB86-2
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB86.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-18-1.
NO
OPEN CB86 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-35. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB86-2. CHECK FOR SHORT BETWEEN GROUND AND P1-35.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB86.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-18-1.
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT BATTERY.CHARGER.

END OF TASK

9-18-11. ECS ICE DET HTR CIRCUIT BREAKER (CB212) - DOES NOT STAY CLOSED OR 115 VAC IS NOT PRESENT AT A76P1-9

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

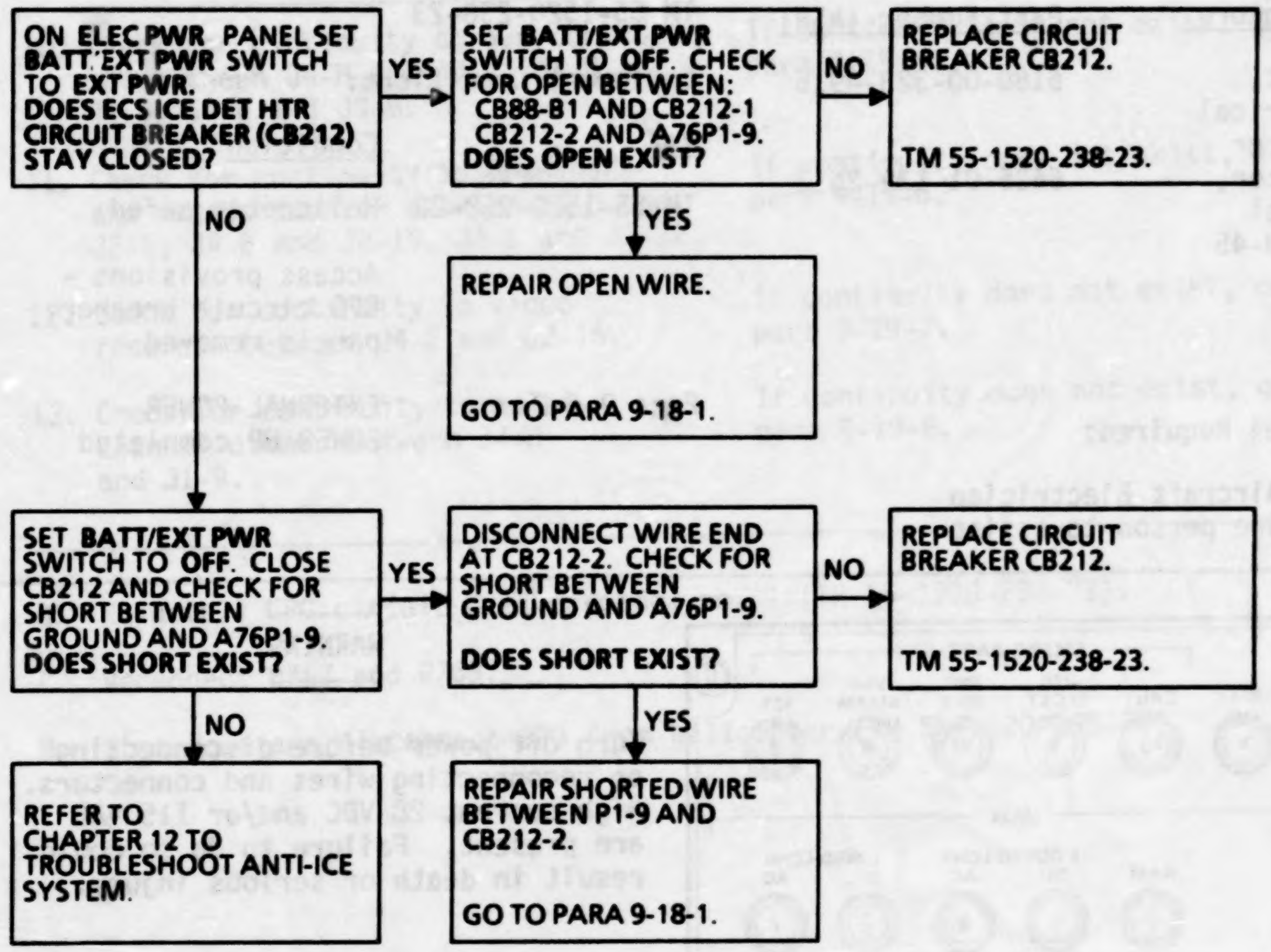
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS ICE DET HTR CIRCUIT BREAKER (CB212) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB88-B1 AND CB212-1 CB212-2 AND A76P1-9. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB212. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-18-1.
NO
SET BATT/EXT PWR SWITCH TO OFF. CLOSE CB212 AND CHECK FOR SHORT BETWEEN GROUND AND A76P1-9. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB212-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-9. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB212. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN P1-9 AND CB212-2. GO TO PARA 9-18-1.
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI-ICE SYSTEM.

END OF TASK

9-19-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - CPG STATION) OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

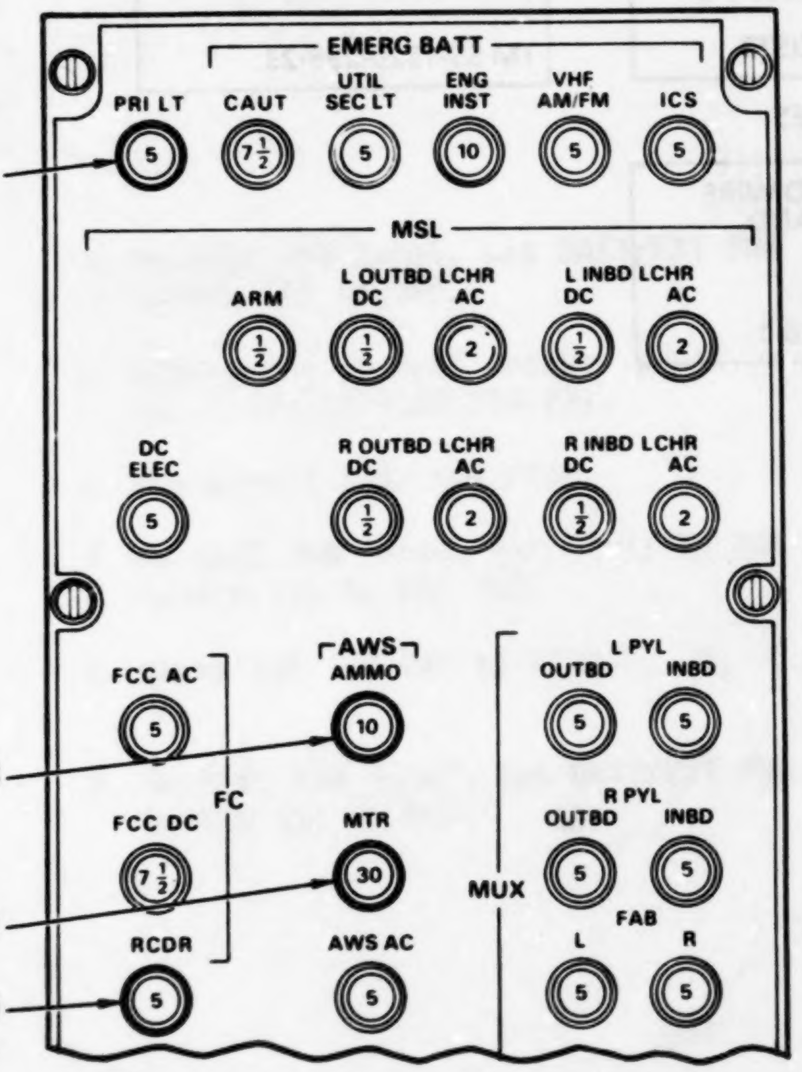
TM 55-1520-238-23

Equipment Conditions:

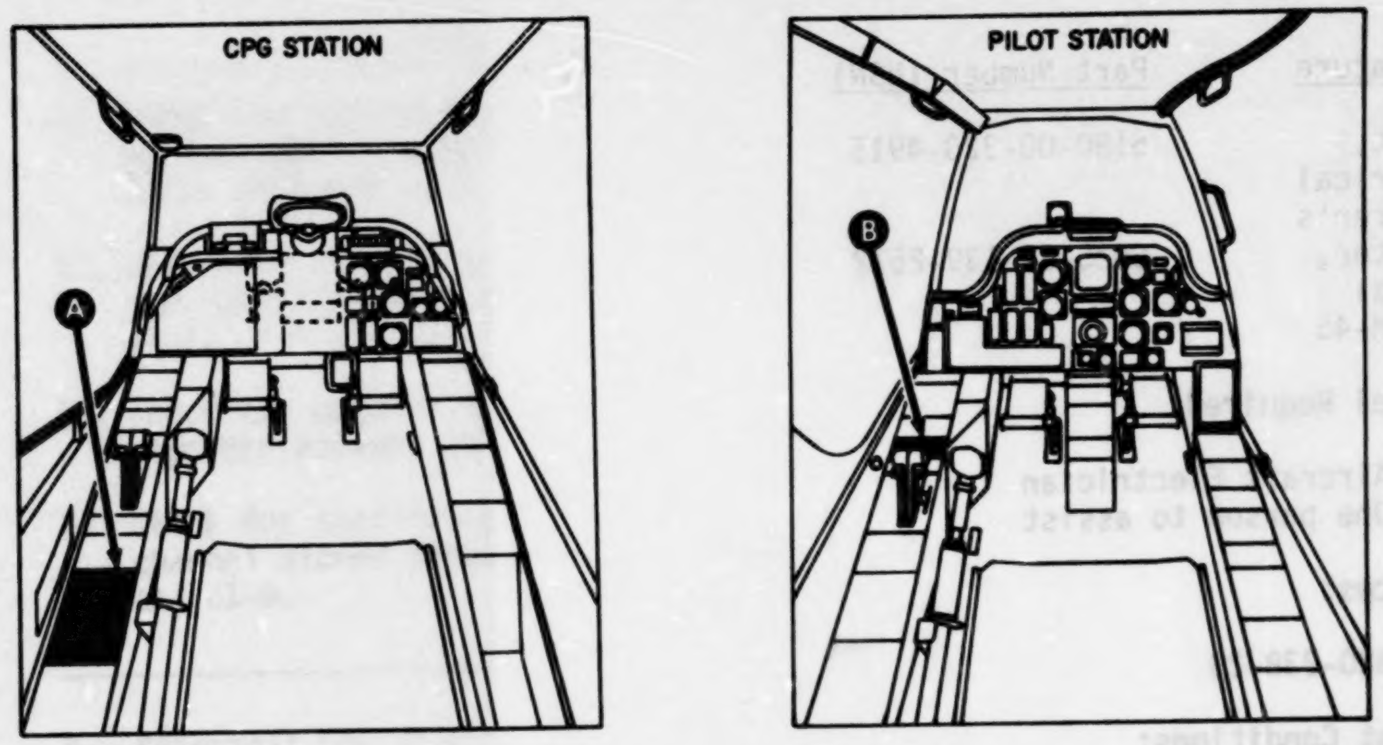
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - CPG circuit breaker panels removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

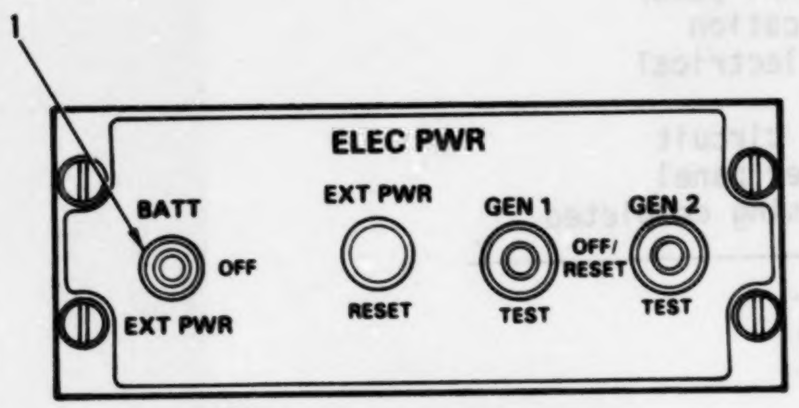
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5
4
MSL
ARM
L OUTBD LCHR DC
AC
L INBD LCHR DC
AC
½
½
2
½
2
DC ELEC
5
R OUTBD LCHR DC
AC
R INBD LCHR DC
AC
½
2
½
2
AWS
AMMO
10
MTR
30
AWS AC
5
FCC AC
5
FCC DC
7½
FC
RCDR
5
3
2
5
MUX
L PYL
OUTBD
INBD
R PYL
OUTBD
INBD
FAB
L
R
5
5
5
5
5
5

A CPG CIRCUIT BREAKER PANEL NO. 1


CPG STATION
A
PILOT STATION
B


1
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
TEST
OFF/ RESET
GEN 2
TEST

B PILOT ELEC PWR PANEL

MM04/1-1009A

GO TO NEXT PAG

9-19-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - CPG STATION) OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On CPG circuit breaker panel no. 1, check that **AWS MTR** (CB3) (2), **AWS AMMO** (CB7) (3), **PRI LT** (CB14) (4), and **FC RCDR** (CB8) (5) circuit breakers are closed.	
2. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
3. Check that circuit breakers closed in step 1 remain closed.	If CB3 (2) does not stay closed, go to para 9-19-5. If CB7 (3) does not stay closed, go to para 9-19-6. If CB8 (5) does not stay closed, go to para 9-19-7. If CB14 (4) does not stay closed, go to para 9-19-8.
4. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
5. Remove CPG circuit breaker panel no. 1 (TM 55-1520-238-23).	
6. Disconnect P767 and P769.	
7. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
8. Check for 115 VAC at P769-H, -B, -E.	If 115 VAC is not present, go to para 9-19-4.
9. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
10. Check for continuity to gun control box between J4-H and J3-4, J4-B and J3-5, J4-E and J3-6.	If continuity does not exist, go to para 9-19-5.
11. Check for continuity to downloader and rounds counter between J4-H and J2-1, J4-B and J2-15, J4-E and J2-22.	If continuity does not exist, go to para 9-19-6.
12. Check for continuity to video recorder between J4-E and J2-16.	If continuity does not exist, go to para 9-19-7.
13. Check for continuity to multi-channel dimmer between J4-H and J1-9.	If continuity does not exist, go to para 9-19-8.

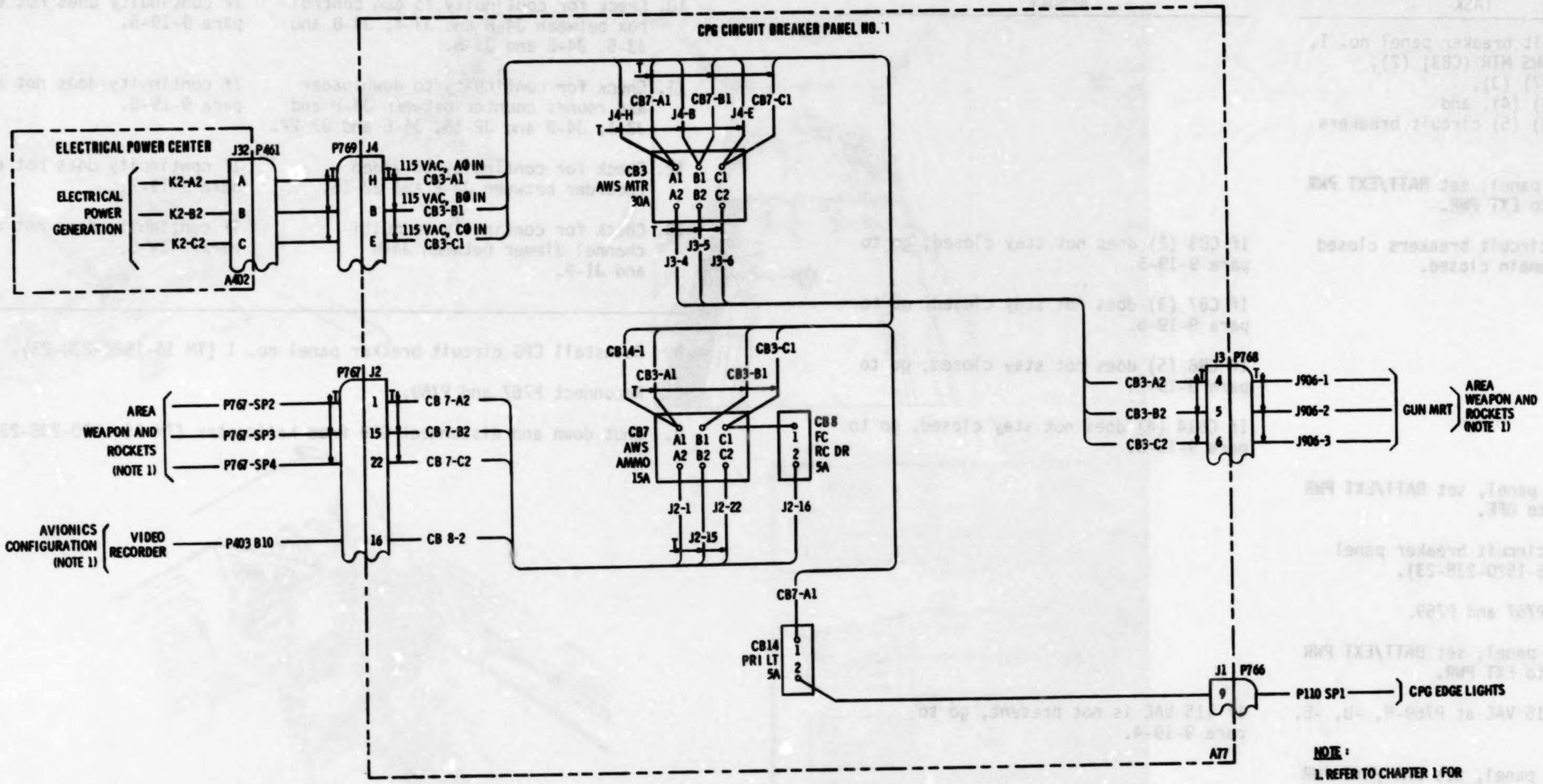
B. Reinstall CPG circuit breaker panel no. 1 (TM 55-1520-238-23).

C. Reconnect P767 and P769.

D. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-19-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - CPG STATION) INTERCONNECTION DIAGRAM

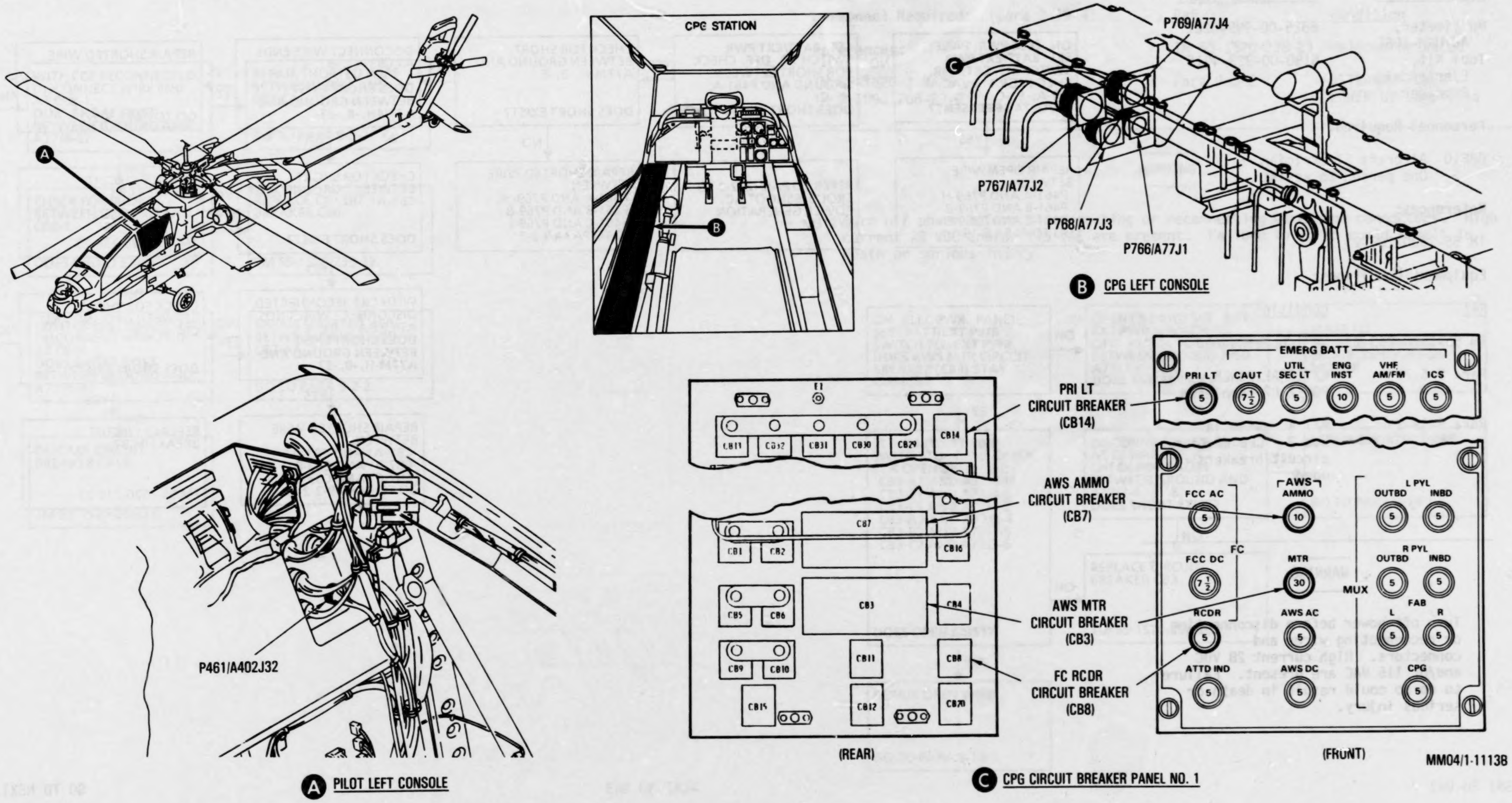

CPG CIRCUIT BREAKER PANEL NO. 1
ELECTRICAL POWER CENTER
ELECTRICAL POWER GENERATION
K2-A2
K2-B2
K2-C2
J32
P461
A
B
C
A402
P769
J4
H
B
E
115 VAC, A0 IN
CB3-A1
115 VAC, B0 IN
CB3-B1
115 VAC, C0 IN
CB3-C1
T
CB7-A1
CB7-B1
CB7-C1
J4-H
J4-B
J4-E
CB3
AWS MTR
30A
A1 B1 C1
A2 B2 C2
J3-5
J3-4
J3-6
AREA WEAPON AND ROCKETS (NOTE 1)
P767-SP2
P767-SP3
P767-SP4
P767
J2
1
15
22
16
CB 7-A2
CB 7-B2
CB 7-C2
CB 8-2
AVIONICS CONFIGURATION (NOTE 1)
VIDEO RECORDER
P403 B10
CB14-1
CB3-C1
CB3-A1
CB3-B1
CB7
AWS
AMMO
15A
CB8
FC
RC DR
5A
J2-1
J2-22
J2-16
J2-15
CB7-A1
CB14
PRI LT
5A
J3
P768
CB3-A2
CB3-B2
CB3-C2
4
5
6
J906-1
J906-2
J906-3
GUN MRT
AREA WEAPON AND ROCKETS (NOTE 1)
J1
P766
9
P110 SP1
CPG EDGE LIGHTS
A77

NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-760B

9-19-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
CPG STATION
B
P461/A402J32
C
P769/A77J4
P767/A77J2
P768/A77J3
P766/A77J1
E1
CB11
CB32
CB31
CB30
CB29
CB14
CB7
CB1
CB2
CB16
CB3
CB4
CB5
CB6
CB9
CB10
CB11
CB8
CB15
CB12
CB70
PRI LT CIRCUIT BREAKER (CB14)
AWS AMMO CIRCUIT BREAKER (CB7)
AWS MTR CIRCUIT BREAKER (CB3)
FC RCDR CIRCUIT BREAKER (CB8)
EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5
FCC AC
AWS
AMMO
L PYL
OUTBD
INBD
5
10
5
5
FCC DC
FC
MTR
R PYL
OUTBD
INBD
7½
30
MUX
5
5
RCDR
AWS AC
FAB
L
R
5
5
5
5
ATTD IND
AWS DC
CPG
5
5
5
(REAR)
(FRONT)
MM04/1-1113B

A PILOT LEFT CONSOLE

B CPG LEFT CONSOLE

C CPG CIRCUIT BREAKER PANEL NO. 1

9-19-4. 115 VAC - IS NOT PRESENT AT P769-H, -B, -E

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

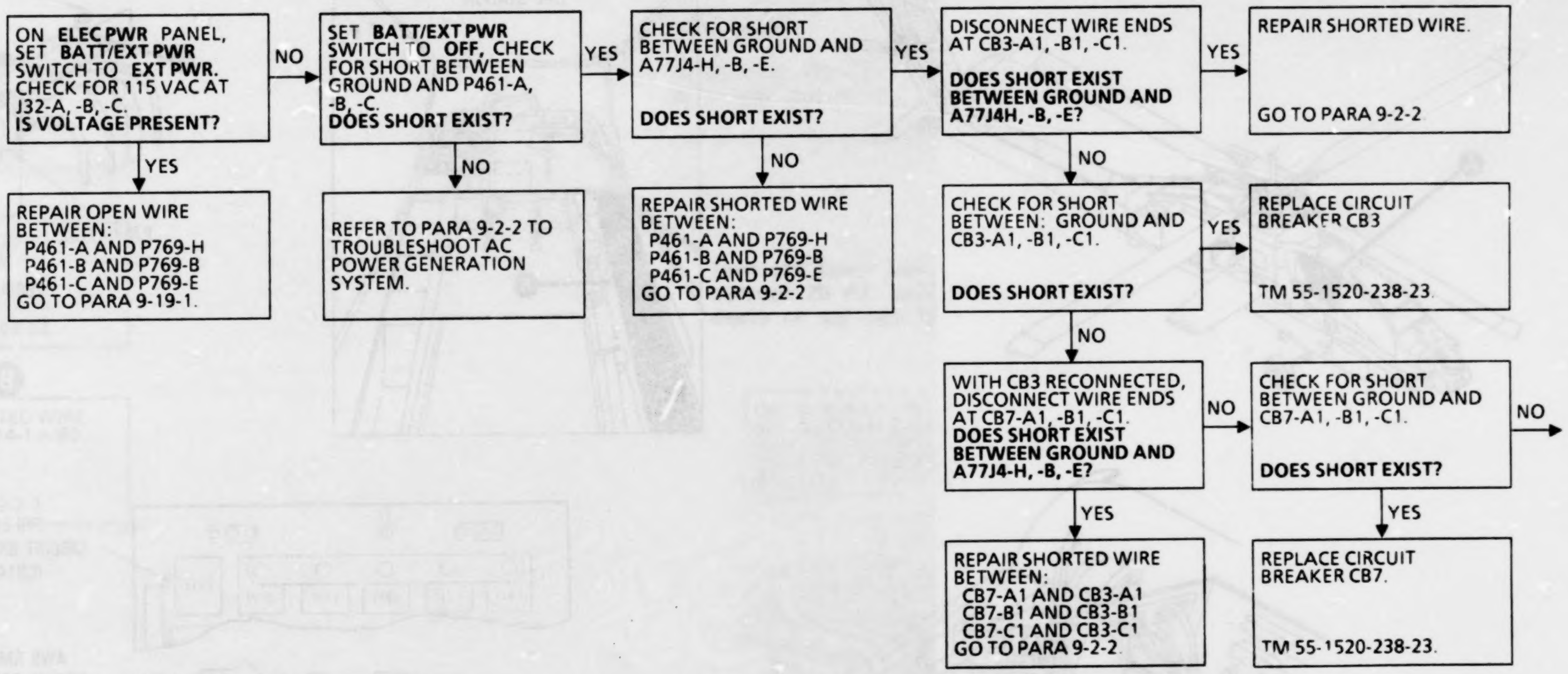
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-19-1	All AC essential bus 2 - CPG station circuit breakers open

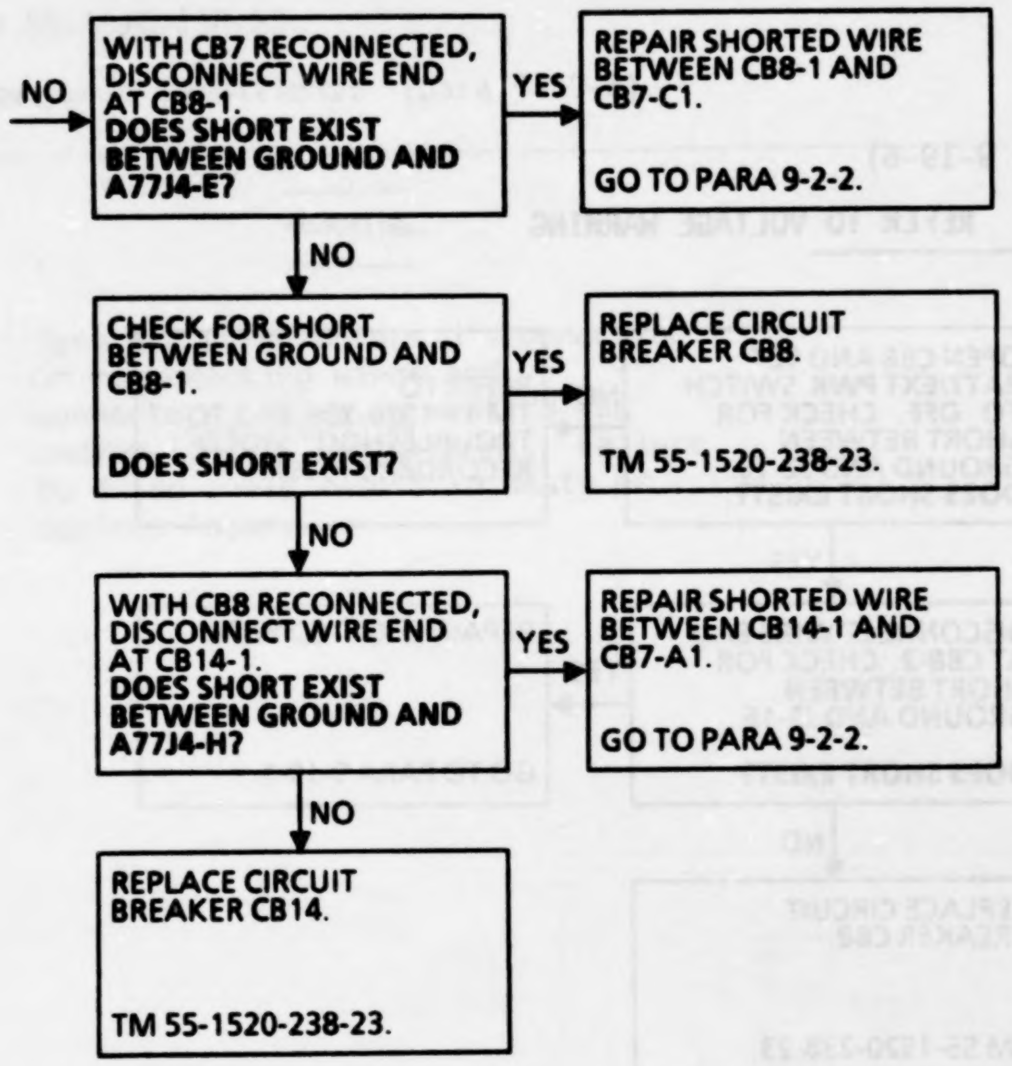
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. CHECK FOR 115 VAC AT J32-A, -B, -C. IS VOLTAGE PRESENT?
NO
YES
REPAIR OPEN WIRE BETWEEN: P461-A AND P769-H P461-B AND P769-B P461-C AND P769-E GO TO PARA 9-19-1.
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P461-A, -B, -C. DOES SHORT EXIST?
YES
NO
REFER TO PARA 9-2-2 TO TROUBLESHOOT AC POWER GENERATION SYSTEM.
CHECK FOR SHORT BETWEEN GROUND AND A77J4-H, -B, -E. DOES SHORT EXIST?
YES
NO
REPAIR SHORTED WIRE BETWEEN: P461-A AND P769-H P461-B AND P769-B P461-C AND P769-E GO TO PARA 9-2-2
DISCONNECT WIRE ENDS AT CB3-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND A77J4H, -B, -E?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-2-2
NO
CHECK FOR SHORT BETWEEN: GROUND AND CB3-A1, -B1, -C1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB3 TM 55-1520-238-23.
NO
WITH CB3 RECONNECTED, DISCONNECT WIRE ENDS AT CB7-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND A77J4-H, -B, -E?
NO
YES
REPAIR SHORTED WIRE BETWEEN: CB7-A1 AND CB3-A1 CB7-B1 AND CB3-B1 CB7-C1 AND CB3-C1 GO TO PARA 9-2-2.
CHECK FOR SHORT BETWEEN GROUND AND CB7-A1, -B1, -C1. DOES SHORT EXIST?
NO
YES
REPLACE CIRCUIT BREAKER CB7. TM 55-1520-238-23.

GO TO NEXT PAGE

9-19-4. 115 VAC - IS NOT PRESENT AT P769-H, -B, -E (cont)


NO
WITH CB7 RECONNECTED, DISCONNECT WIRE END AT CB8-1. DOES SHORT EXIST BETWEEN GROUND AND A77J4-E?
YES
REPAIR SHORTED WIRE BETWEEN CB8-1 AND CB7-C1. GO TO PARA 9-2-2.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB8-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB8. TM 55-1520-238-23.
NO
WITH CB8 RECONNECTED, DISCONNECT WIRE END AT CB14-1. DOES SHORT EXIST BETWEEN GROUND AND A77J4-H?
YES
REPAIR SHORTED WIRE BETWEEN CB14-1 AND CB7-A1. GO TO PARA 9-2-2.
NO
REPLACE CIRCUIT BREAKER CB14. TM 55-1520-238-23.

END OF TASK

9-19-5. AWS MTR CIRCUIT BREAKER (CB3) - DOES NOT STAY CLOSED OR CONTINUITY TO GUN CONTROL BOX DOES NOT EXIST BETWEEN J4-H AND J3-4, J4-B AND J3-5, J4-E AND J3-6

Tools: (para 9-19-4)

Personnel Required: (para 9-19-4)

References:

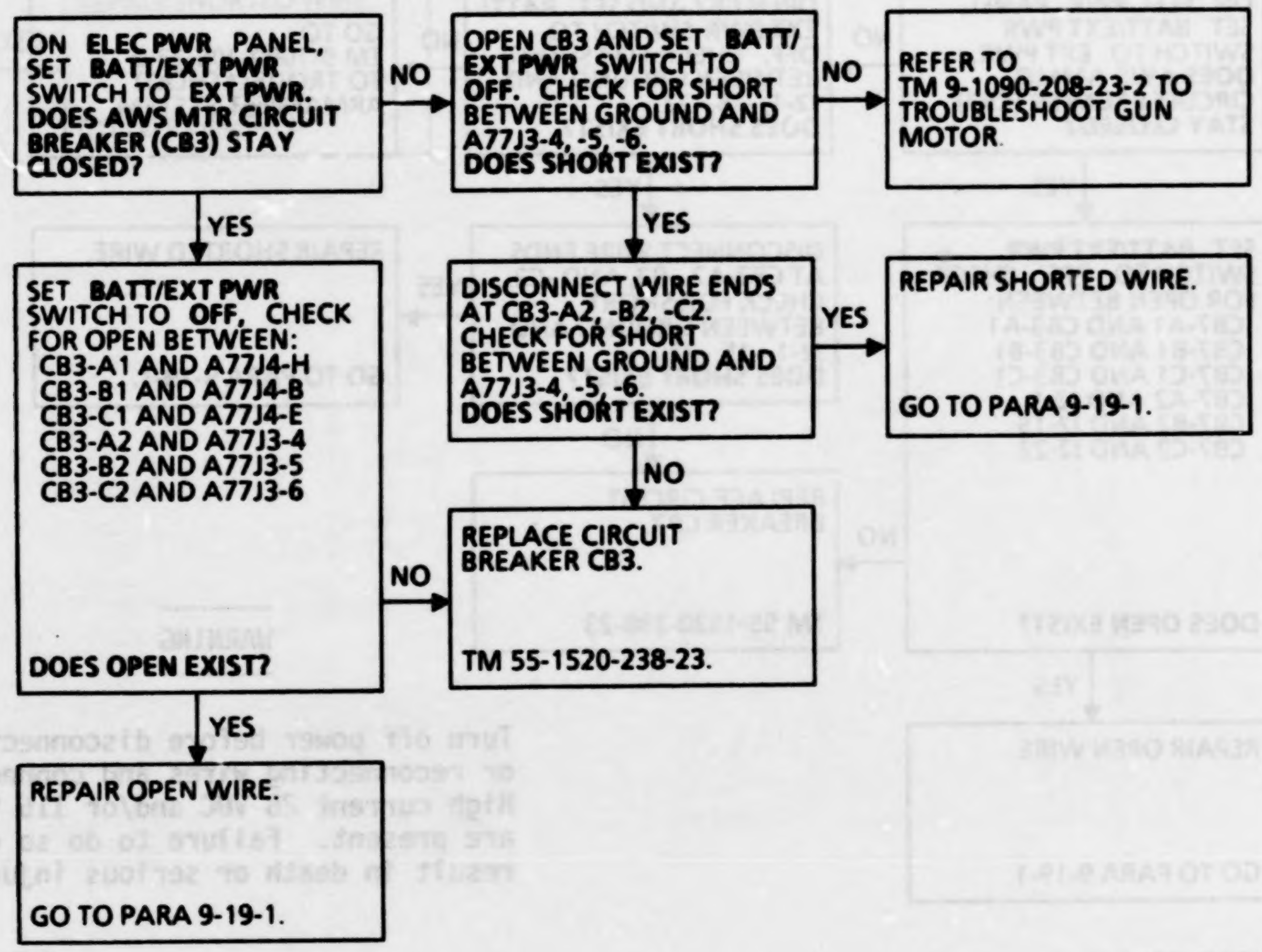
TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES AWS MTR CIRCUIT BREAKER (CB3) STAY CLOSED?
NO
OPEN CB3 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J3-4, -5, -6. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT GUN MOTOR.
YES
DISCONNECT WIRE ENDS AT CB3-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A77J3-4, -5, -6. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-19-1.
NO
REPLACE CIRCUIT BREAKER CB3. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB3-A1 AND A77J4-H CB3-B1 AND A77J4-B CB3-C1 AND A77J4-E CB3-A2 AND A77J3-4 CB3-B2 AND A77J3-5 CB3-C2 AND A77J3-6 DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-19-1.

END OF TASK

9-19-6. AWS AMMO CIRCUIT BREAKER (CB7) - DOES NOT STAY CLOSED OR CONTINUITY TO DOWNLOADER AND ROUNDS COUNTER DOES NOT EXIST BETWEEN J4-H AND J2-1, J4-B AND J2-15, J4-E AND J2-22

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

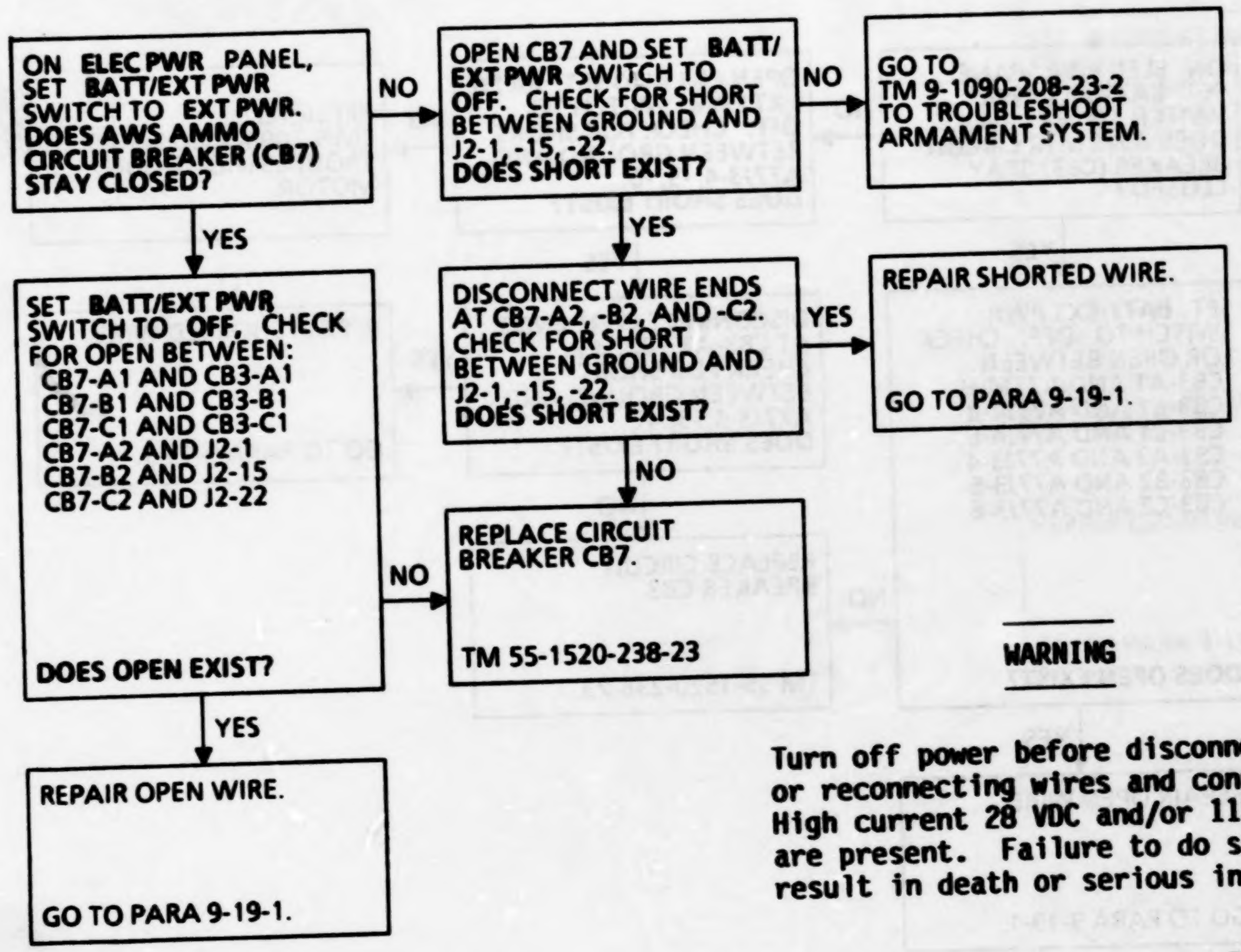
References:

TM 55-1520-238-23
TM 9 1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES AWS AMMO CIRCUIT BREAKER (CB7) STAY CLOSED?
NO
OPEN CB7 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND J2-1, -15, -22. DOES SHORT EXIST?
NO
GO TO TM 9-1090-208-23-2 TO TROUBLESHOOT ARMAMENT SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB7-A1 AND CB3-A1 CB7-B1 AND CB3-B1 CB7-C1 AND CB3-C1 CB7-A2 AND J2-1 CB7-B2 AND J2-15 CB7-C2 AND J2-22 DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB7-A2, -B2, AND -C2. CHECK FOR SHORT BETWEEN GROUND AND J2-1, -15, -22. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-19-1.
NO
REPLACE CIRCUIT BREAKER CB7. TM 55-1520-238-23
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-19-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-19-7. FC RC DR CIRCUIT BREAKER (CB8) DOES NOT STAY CLOSED OR CONTINUITY TO VIDEO RECORDER DOES NOT EXIST BETWEEN J4-E AND J2-16

Tools: (para 9-19-6)

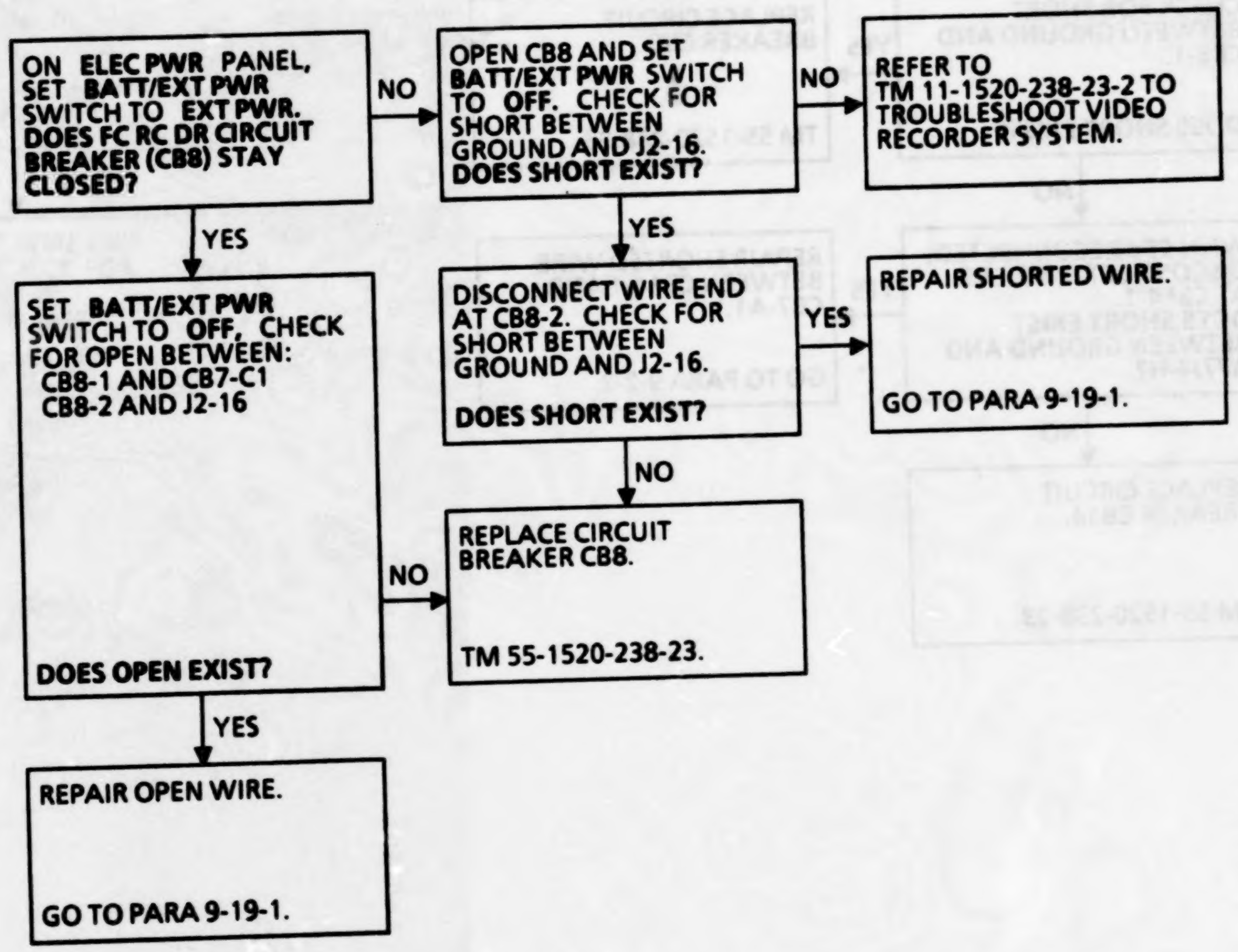
Personnel Required: (para 9-19-6)

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions: (para 9-19-6)

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FC RC DR CIRCUIT BREAKER (CB8) STAY CLOSED?
NO
OPEN CB8 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND J2-16. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT VIDEO RECORDER SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB8-1 AND CB7-C1 CB8-2 AND J2-16 DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB8-2. CHECK FOR SHORT BETWEEN GROUND AND J2-16. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-19-1.
NO
REPLACE CIRCUIT BREAKER CB8. TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-19-1.

END OF TASK

9-19-8. PRI LT CIRCUIT BREAKER (CB14) DOES NOT STAY CLOSED OR CONTINUITY TO MULTI-CHANNEL DIMMING CONTROLLER DOES NOT EXIST BETWEEN J4-H AND J1-9

Tools: (para 9-19-6)

Personnel Required: (para 9-19-6)

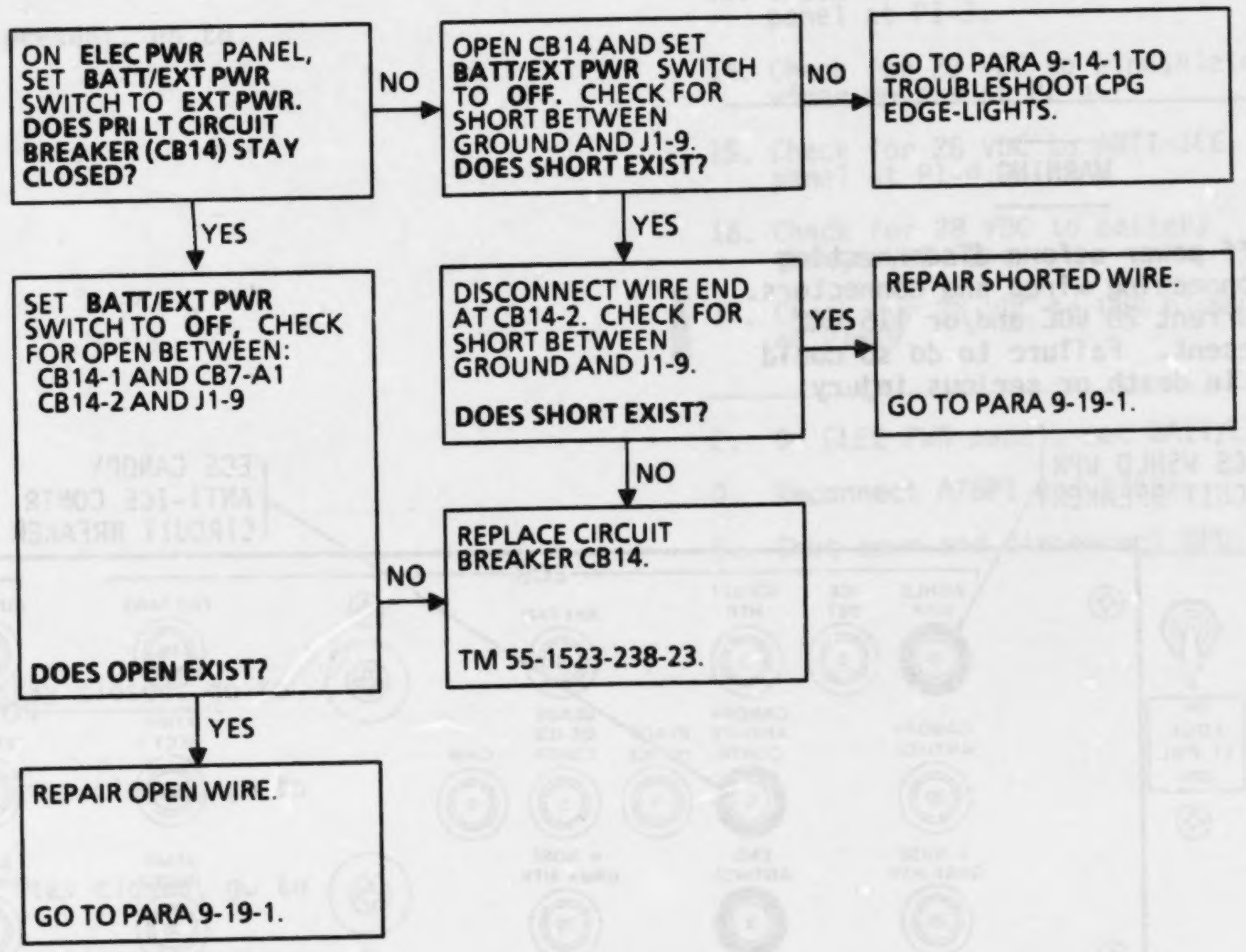
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-19-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES PRI LT CIRCUIT BREAKER (CB14) STAY CLOSED?

OPEN CB14 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND J1-9. DOES SHORT EXIST?

GO TO PARA 9-14-1 TO TROUBLESHOOT CPG EDGE-LIGHTS.

SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB14-1 AND CB7-A1 CB14-2 AND J1-9 DOES OPEN EXIST?

DISCONNECT WIRE END AT CB14-2. CHECK FOR SHORT BETWEEN GROUND AND J1-9. DOES SHORT EXIST?

REPAIR SHORTED WIRE. GO TO PARA 9-19-1.

REPLACE CIRCUIT BREAKER CB14. TM 55-1523-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-19-1.

END OF TASK

9-20-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

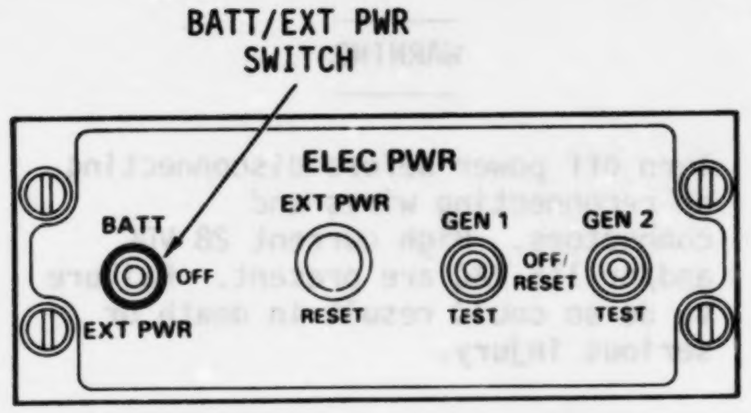
TM 55-1520-238-23

Equipment Conditions:

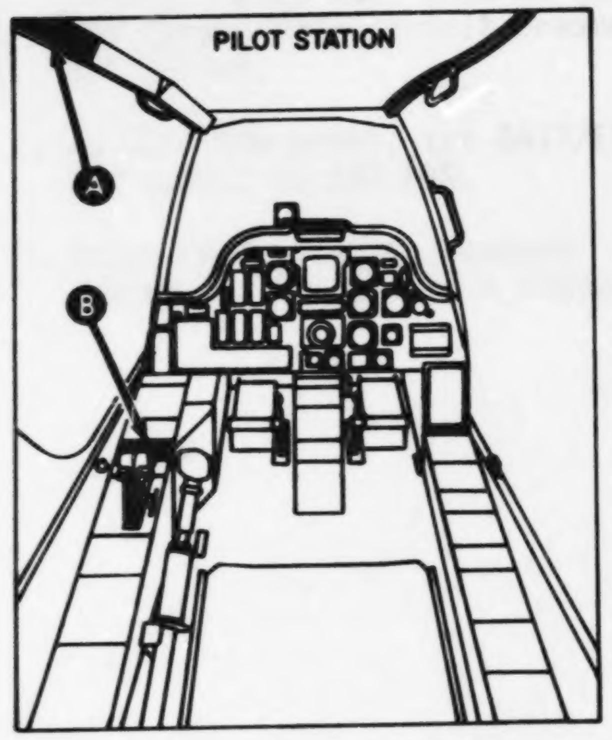
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

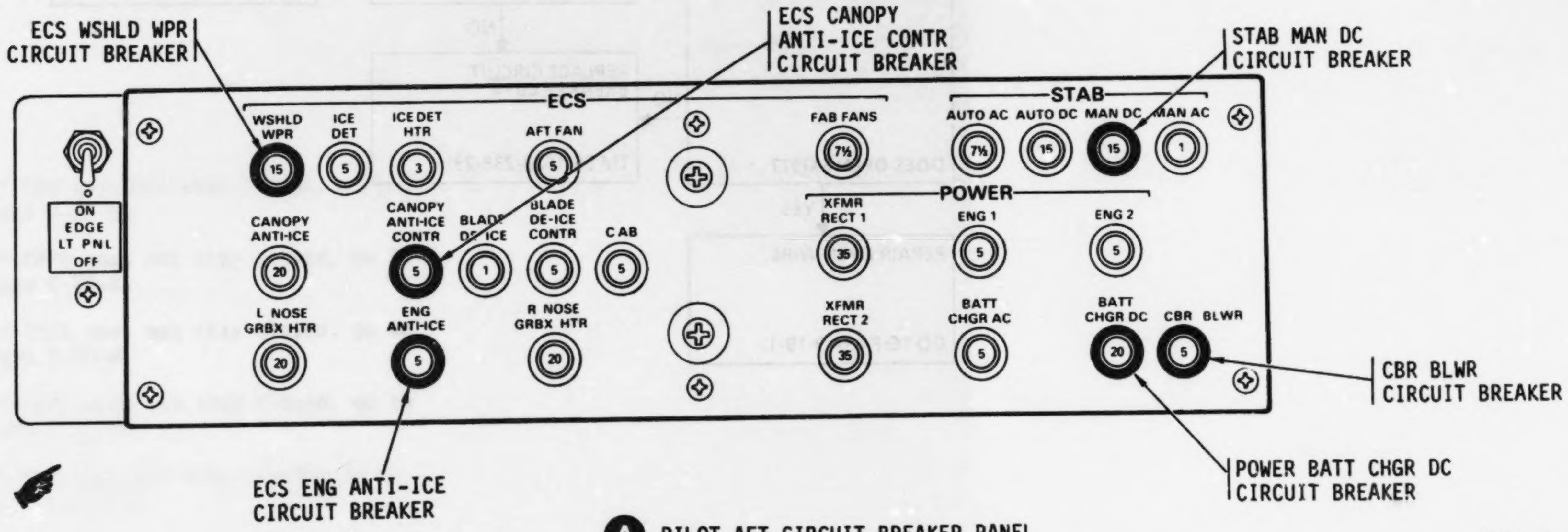
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


BATT/EXT PWR SWITCH
ELEC PWR
EXT PWR
BATT
OFF
EXT PWR
RESET
GEN 1
OFF/ RESET
GEN 2
TEST
TEST

Ⓑ PILOT ELECT PWR PANEL


PILOT STATION
A
B


ECS WSHLD WPR CIRCUIT BREAKER
ECS CANOPY ANTI-ICE CONTR CIRCUIT BREAKER
STAB MAN DC CIRCUIT BREAKER
ECS
STAB
ON
EDGE
LT PNL
OFF
WSHLD WPR
15
ICE DET
5
ICE DET HTR
3
AFT FAN
5
FAB FANS
7½
AUTO AC
7½
AUTO DC
15
MAN DC
15
MAN AC
1
POWER
CANOPY ANTI-ICE
20
CANOPY ANTI-ICE CONTR
5
BLADE DE ICE
1
BLADE DE-ICE CONTR
5
CAB
5
XFMR RECT 1
35
ENG 1
5
ENG 2
5
L NOSE GRBX HTR
20
ENG ANTI-ICE
5
R NOSE GRBX HTR
20
XFMR RECT 2
35
BATT CHGR AC
5
BATT CHGR DC
20
CBR BLWR
5
CBR BLWR CIRCUIT BREAKER
POWER BATT CHGR DC CIRCUIT BREAKER
ECS ENG ANTI-ICE CIRCUIT BREAKER

Ⓐ PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1010E

GO TO NEXT PAGE

9-20-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK (cont)

A. On aft circuit breaker panel, disconnect A76P4.

B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P4-M and -N.	If short exists, go to para 9-20-4.
2. On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR.	
3. Check for 28 VDC at A402J4-M, -N.	If 28 VDC is not present, go to para 9-3-1.
4. On ELEC PWR panel, set BATT/EXT PWR switch to OFF.	
5. On electrical power distribution box reconnect A76P4.	
6. On pilot circuit breaker panel, check that STAB MAN DC (CB6), ECS CANOPY ANTI ICE CONTR (CB70), ECS WSHLD WPR (CB71), ECS ENG ANTI ICE (CB67), POWER BATT CHGR DC (CB5) CBR BLWR (CB94) circuit breakers are closed.	
7. On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR.	
8. Check that circuit breakers closed in step 6 remain closed.	If CB6 does not stay closed, go to para 9-20-5. If CB70 does not stay closed, go to para 9-20-6. If CB71 does not stay closed, go to para 9-20-8. If CB67 does not stay closed, go to para 9-20-9. If CB5 does not stay closed, go to para 9-20-10. If CB94 does not stay closed, go to para 9-20-11.
9. On ELEC PWR panel, set BATT/EXT PWR switch to OFF.	
10. Disconnect A76P1 and A76P2.	
11. On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR.	
12. Check for 28 VDC to stabilator relay panel at P2-g.	If 28 VDC is not present, go to para 9-20-5.
13. Check for 28 VDC to anti-ice panel at P1-3.	If 28 VDC is not present, go to para 9-20-6.
14. Check for 28 VDC to windshield wiper motors at P2-b.	If 28 VDC is not present, go to para 9-20-8.
15. Check for 28 VDC to ANTI-ICE panel at P1-4.	If 28 VDC is not present, go to para 9-20-9.
16. Check for 28 VDC to battery charger at P2-a.	If 28 VDC is not present, go to para 9-20-10.
17. Check for 28 VDC to CBR blower at P1-19.	If 28 VDC is not present, go to para 9-20-11.

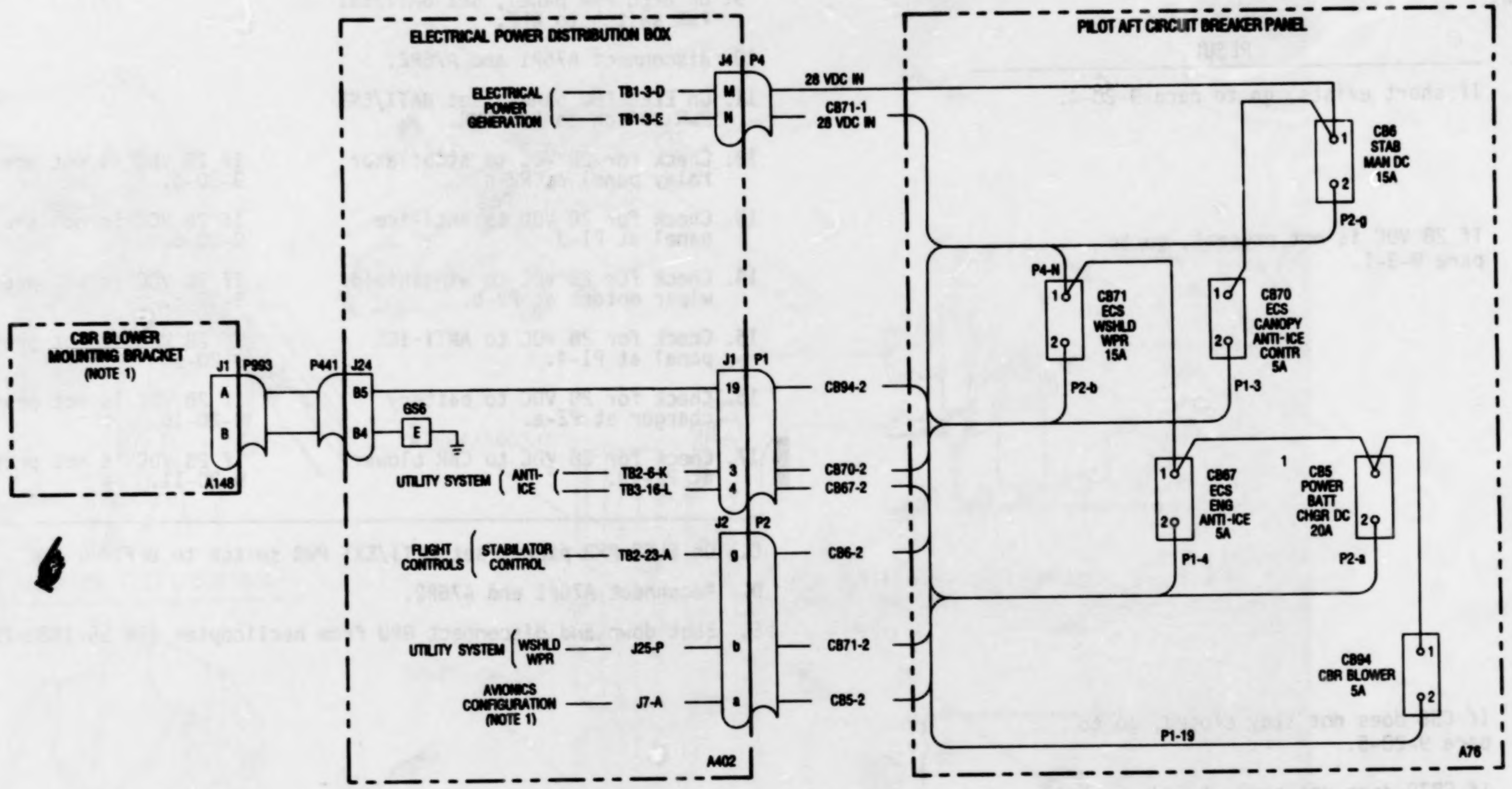
C. On ELEC PWR panel, set BATT/EXT PWR switch to OFF.

D. Reconnect A76P1 and A76P2.

E. Shut down and disconnect GPU from heclicopter (TM 55-1520-238-23).

END OF TASK

9-20-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - PILOT STATION) - INTERCONNECTION DIAGRAM

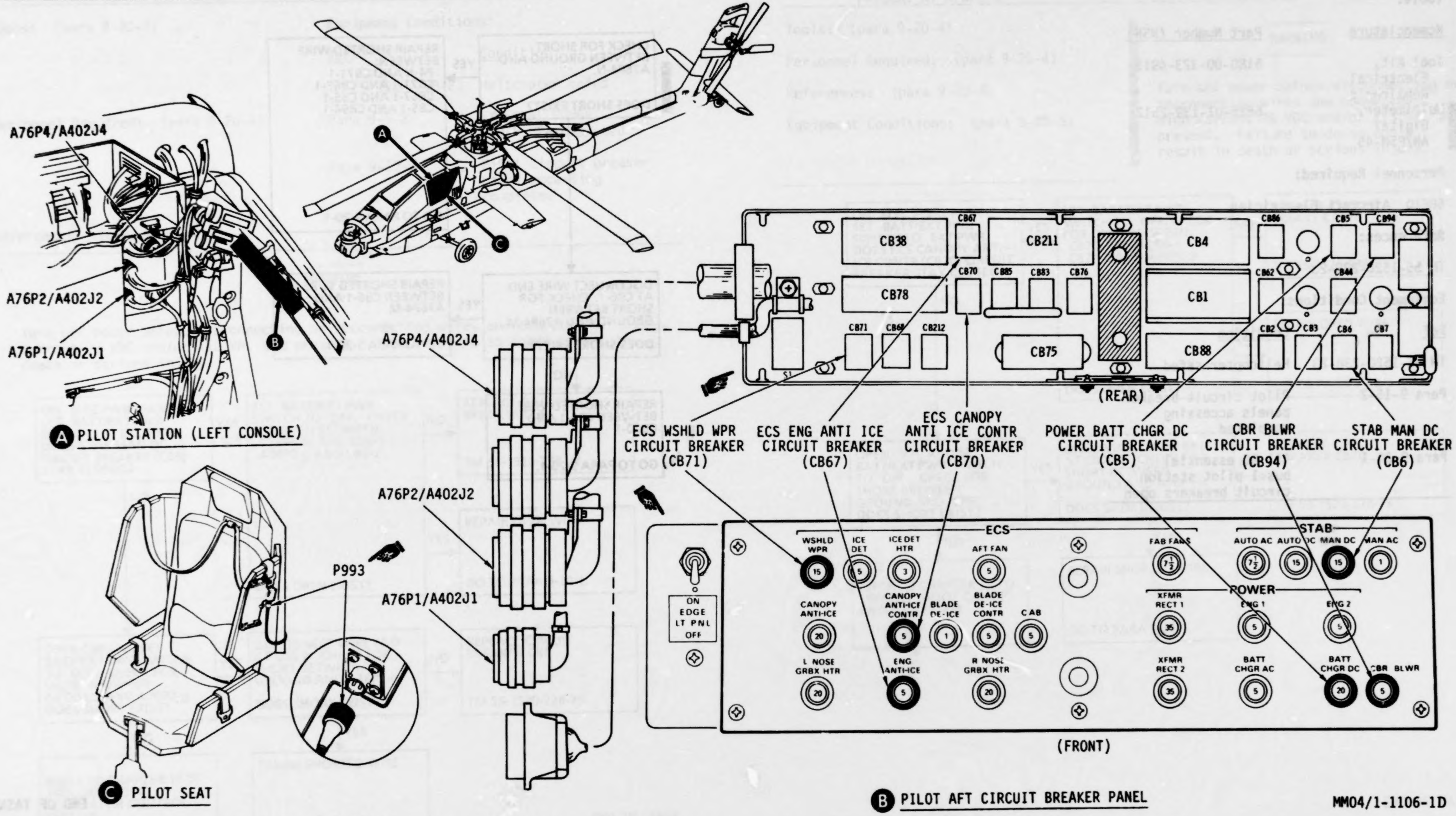

CBR BLOWER
MOUNTING BRACKET
(NOTE 1)
J1
P993
A
B
A148
P441
J24
B5
B4
GS6
E
ELECTRICAL POWER DISTRIBUTION BOX
J4
P4
ELECTRICAL
POWER
GENERATION
TB1-3-D
TB1-3-E
M
N
28 VDC IN
CB71-1
28 VDC IN
J1
P1
19
CB94-2
UTILITY SYSTEM
ANTI-
ICE
TB2-6-K
TB3-16-L
3
4
CB70-2
CB67-2
J2
P2
FLIGHT
CONTROLS
STABILATOR
CONTROL
TB2-23-A
g
CB6-2
UTILITY SYSTEM
WSHLD
WPR
J25-P
b
CB71-2
AVIONICS
CONFIGURATION
(NOTE 1)
J7-A
a
CB5-2
A402
PILOT AFT CIRCUIT BREAKER PANEL
CB6
STAB
MAN DC
15A
1
2
P2-g
P4-N
CB71
ECS
WSHLD
WPR
15A
P2-b
CB70
ECS
CANOPY
ANTI-ICE
CONTR
5A
P1-3
CB67
ECS
ENG
ANTI-ICE
5A
P1-4
CB5
POWER
BATT
CHGR DC
20A
P2-a
CB94
CBR BLOWER
5A
P1-19
A76

NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-761G

9-20-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



A76P4/A402J4
A76P2/A402J2
A76P1/A402J1
A
B
C
A76P4/A402J4
A76P2/A402J2
A76P1/A402J1
P993
CB38
CB67
CB211
CB4
CB86
CB5
CB94
CB78
CB70
CB85
CB83
CB76
CB1
CB62
CB44
CB71
CB68
CB212
CB75
CB88
CB2
CB3
CB6
CB7
S1
(REAR)
ECS WSHLD WPR CIRCUIT BREAKER (CB71)
ECS ENG ANTI ICE CIRCUIT BREAKER (CB67)
ECS CANOPY ANTI ICE CONTR CIRCUIT BREAKER (CB70)
POWER BATT CHGR DC CIRCUIT BREAKER (CB5)
CBR BLWR CIRCUIT BREAKER (CB94)
STAB MAN DC CIRCUIT BREAKER (CB6)
ON
EDGE
LT PNL
OFF
ECS
WSHLD WPR
15
ICE DET
5
ICE DET HTR
3
AFT FAN
5
CANOPY ANTI-ICE
20
CANOPY ANTI-ICE CONTR
5
BLADE DE-ICE
1
BLADE DE-ICE CONTR
5
C AB
5
L NOSE GRBX HTR
20
ENG ANTI-ICE
5
R NOSE GRBX HTR
20
FAB FANS
7½
STAB
AUTO AC
7½
AUTO DC
15
MAN DC
15
MAN AC
1
POWER
XFMR RECT 1
35
ENG 1
5
ENG 2
5
XFMR RECT 2
35
BATT CHGR AC
5
BATT CHGR DC
20
CBR BLWR
5
(FRONT)

A PILOT STATION (LEFT CONSOLE)

C PILOT SEAT

B PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1106-1D

9-20-4. SHORT EXISTS BETWEEN GROUND AND A76P4-M OR -N

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

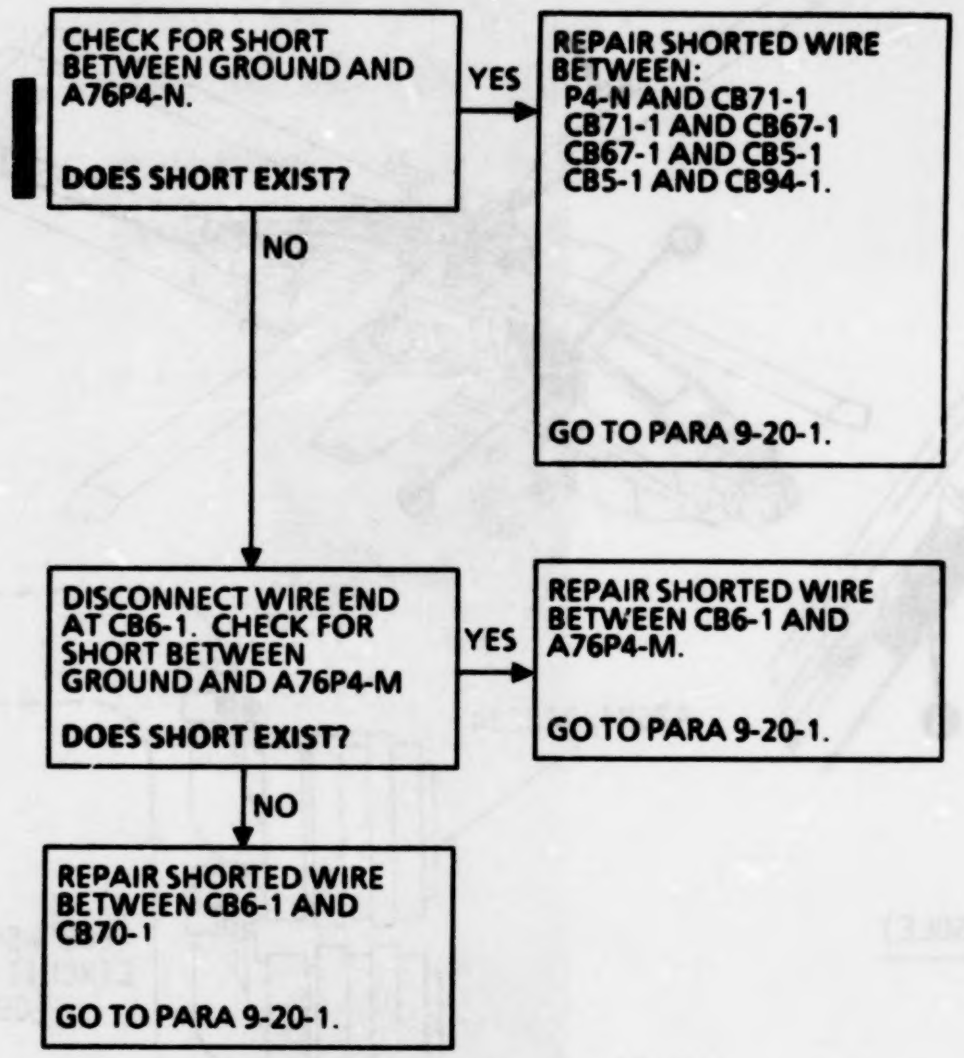
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panels accessing completed
Para 9-20-1	All DC essential bus 1 pilot station circuit breakers open



CHECK FOR SHORT BETWEEN GROUND AND A76P4-N.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN:
P4-N AND CB71-1
CB71-1 AND CB67-1
CB67-1 AND CB5-1
CB5-1 AND CB94-1.

GO TO PARA 9-20-1.

DISCONNECT WIRE END AT CB6-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-M

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB6-1 AND A76P4-M.

GO TO PARA 9-20-1.

REPAIR SHORTED WIRE BETWEEN CB6-1 AND CB70-1

GO TO PARA 9-20-1.

END OF TASK

9-20-5. STAB MAN DC CIRCUIT BREAKER (CB6) - DOES NOT STAY CLOSED OR 28 VDC TO STABILATOR RELAY PANEL IS NOT PRESENT AT A76P2-g

Tools: (para 9-20-4)

Personnel Required: (para 9-20-4)

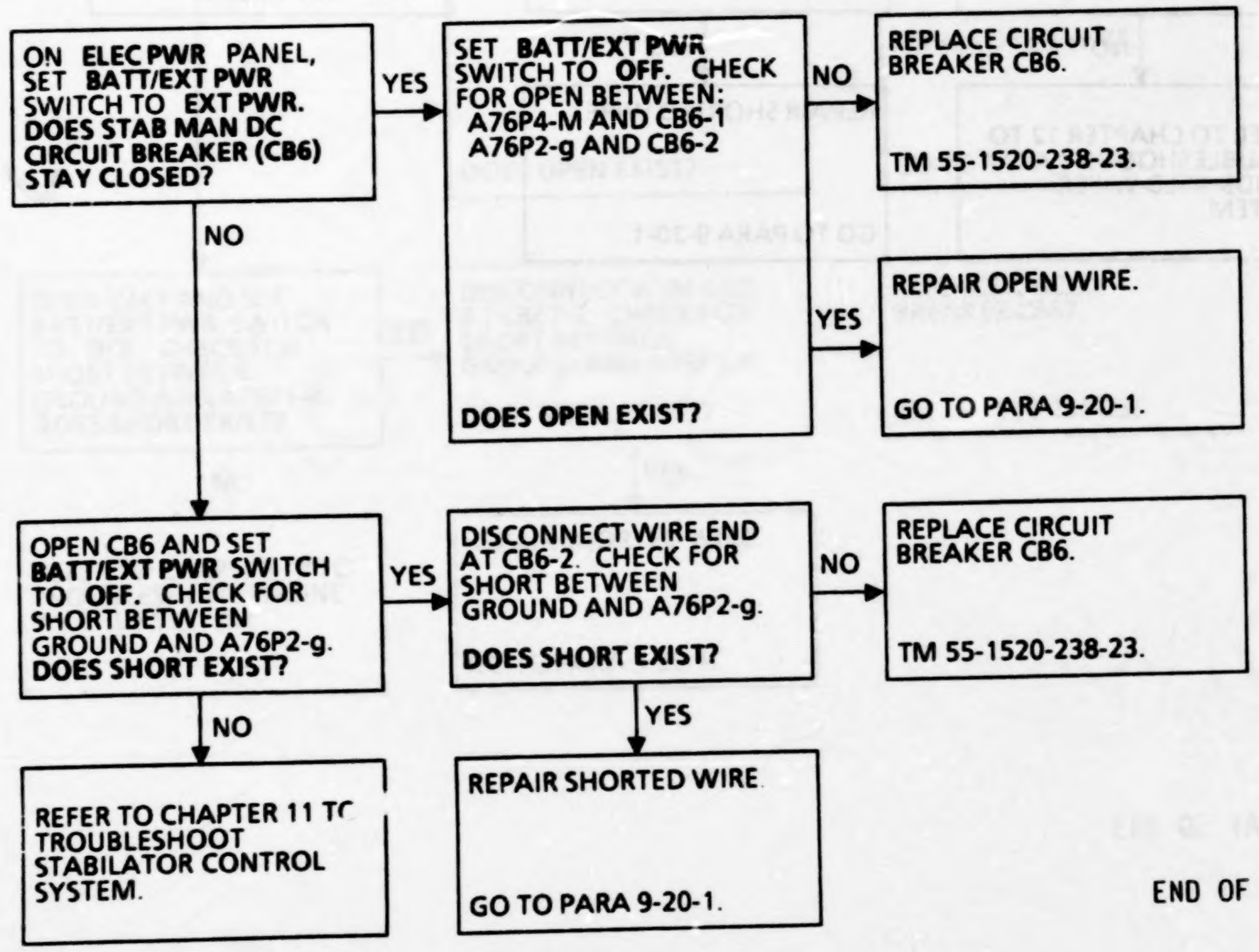
References: (para 9-20-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES STAB MAN DC CIRCUIT BREAKER (CB6) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: A76P4-M AND CB6-1 A76P2-g AND CB6-2
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB6.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-20-1.
NO
OPEN CB6 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P2-g. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB6-2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-g.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB6.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-20-1.
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR CONTROL SYSTEM.

END OF TASK

9-20-6. ECS CANOPY ANTI ICE CONTR CIRCUIT BREAKER (CB70) - DOES NOT STAY CLOSED OR 28 VDC TO ANTI ICE PANEL IS NOT PRESENT AT A76P1-3

Tools: (para 9-20-4)

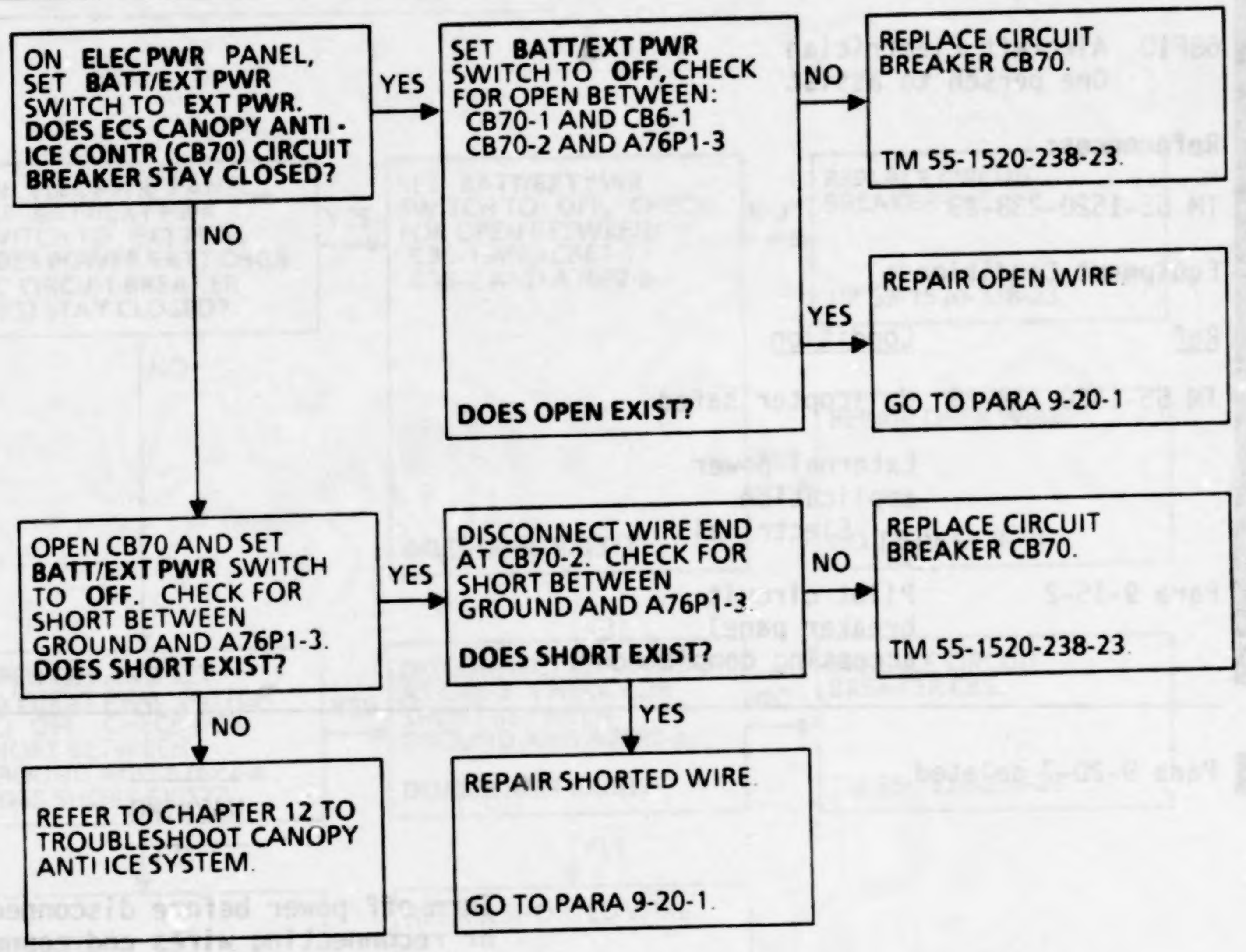
Personnel Required: (para 9-20-4)

References: (para 9-20-4)

Equipment Conditions: (para 9-20-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS CANOPY ANTI - ICE CONTR (CB70) CIRCUIT BREAKER STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB70-1 AND CB6-1 CB70-2 AND A76P1-3
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB70.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE
GO TO PARA 9-20-1
NO
OPEN CB70 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-3. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB70-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-3.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB70.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-20-1.
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT CANOPY ANTI ICE SYSTEM.

END OF TASK

9-20-8. ECS WSHLD WPR CIRCUIT BREAKER (CB71) - DOES NOT STAY CLOSED OR 28 VDC TO WINDSHIELD WIPER MOTORS IS NOT PRESENT AT A76P2-b

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

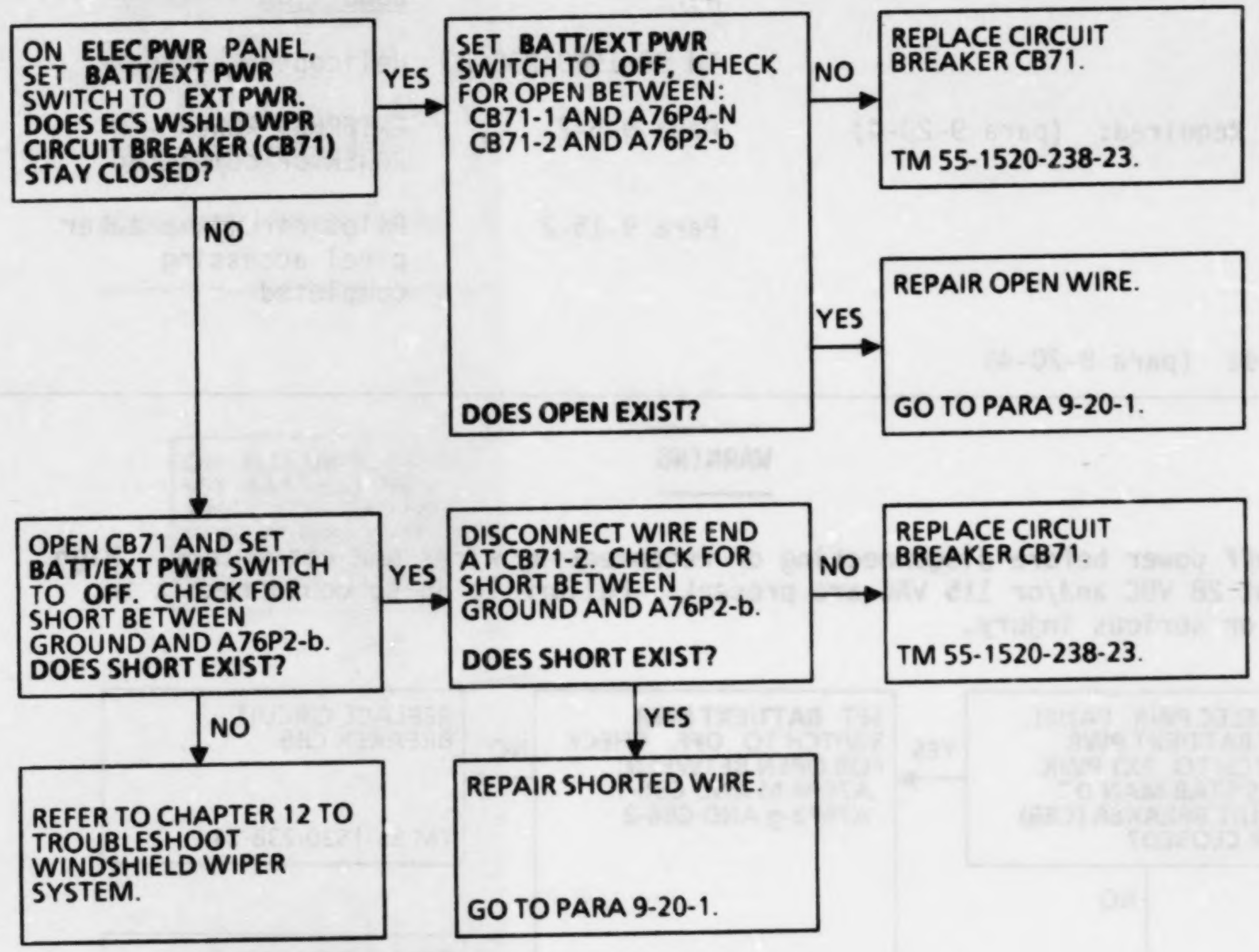
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
Para 9-15-2	Pilot circuit breaker panel accessing completed

Para 9-20-7 deleted.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS WSHLD WPR CIRCUIT BREAKER (CB71) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB71-1 AND A76P4-N CB71-2 AND A76P2-b DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB71. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-20-1.
NO
OPEN CB71 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P2-b. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB71-2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-b. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB71. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-20-1.
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT WINDSHIELD WIPER SYSTEM.

9-20-9. ECS ENG ANTI ICE CIRCUIT BREAKER (CB67) - DOES NOT STAY CLOSED OR 29 VDC TO ANTI ICE PANEL IS NOT PRESENT AT A76P1-4

Tools: (para 9-20-8)

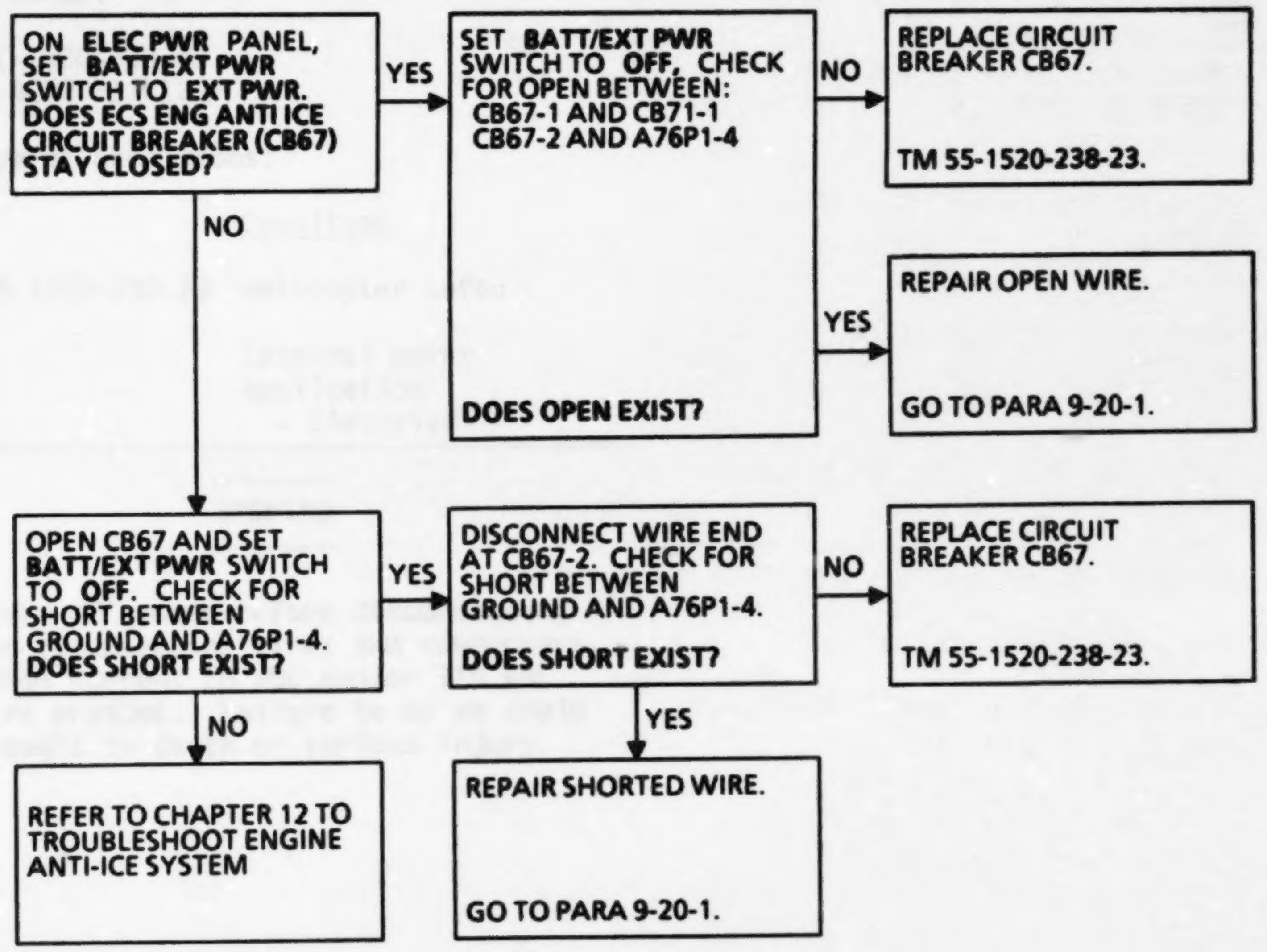
Personnel Required: (para 9-20-8)

References: (para 9-20-8)

Equipment Conditions: (para 9-20-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS ENG ANTI ICE CIRCUIT BREAKER (CB67) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB67-1 AND CB71-1 CB67-2 AND A76P1-4 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB67. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-20-1.
NO
OPEN CB67 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-4. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB67-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-4. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB67. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-20-1.
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT ENGINE ANTI-ICE SYSTEM

END OF TASK

9-20-10. POWER BATT CHGR DC CIRCUIT BREAKER (CB5) - DOES NOT STAY CLOSED OR 28 VDC TO BATTERY CHARGER IS NOT PRESENT AT A76P2-a

Tools: (para 9-20-8)

Personnel Required: (para 9-20-8)

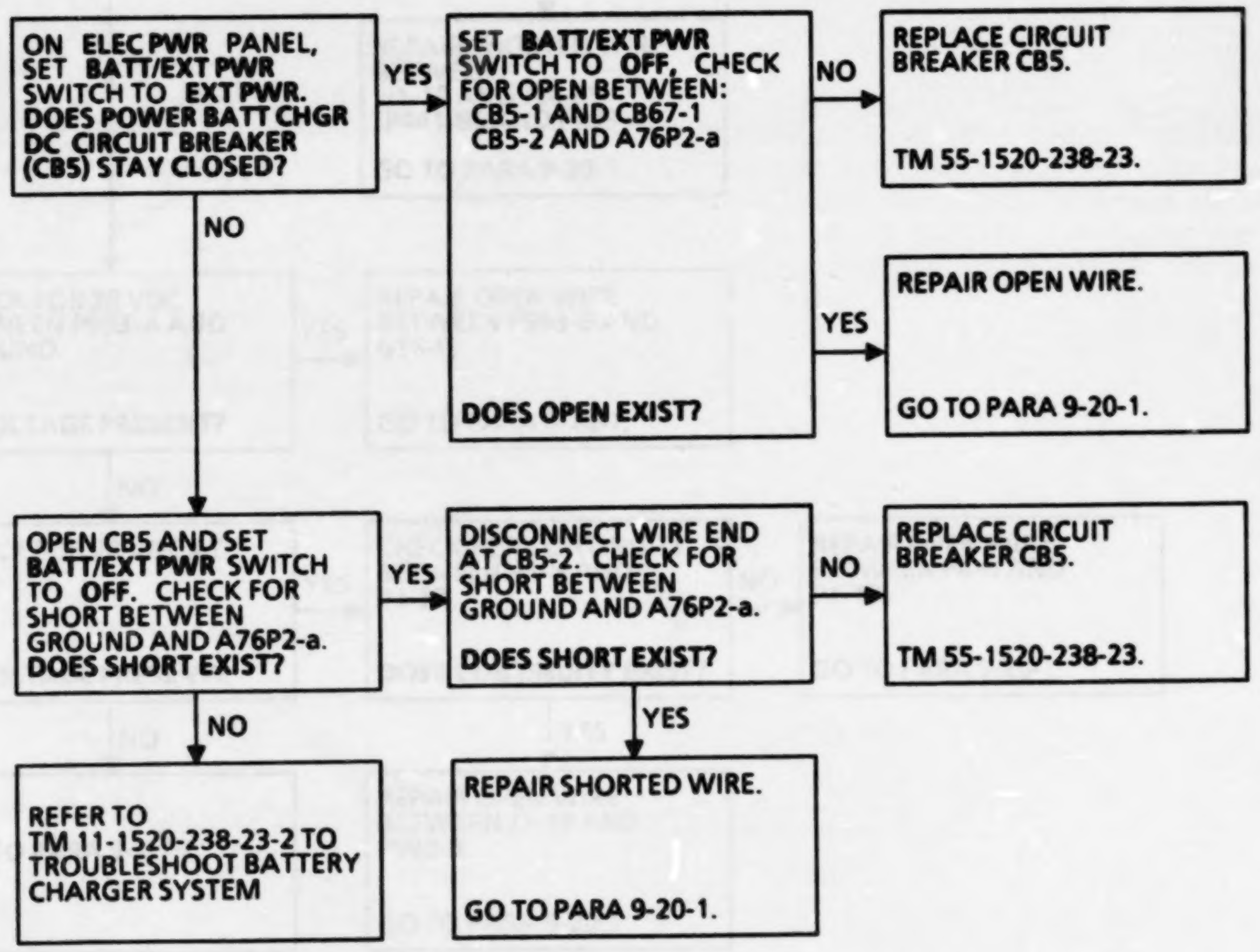
References:

TM 11-1520-238-23-2
TM 55-1520-238-23

Equipment Conditions: (para 9-20-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES POWER BATT CHGR DC CIRCUIT BREAKER (CB5) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB5-1 AND CB67-1 CB5-2 AND A76P2-a DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB5. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-20-1.
NO
OPEN CB5 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P2-a. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB5-2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-a. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB5. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-20-1.
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT BATTERY CHARGER SYSTEM

END OF TASK

9-20-11. PILOT CBR BLWR CIRCUIT BREAKER (CB94) - DOES NOT STAY CLOSED, OR 28 VDC IS NOT PRESENT BETWEEN P993-A AND P993-B

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

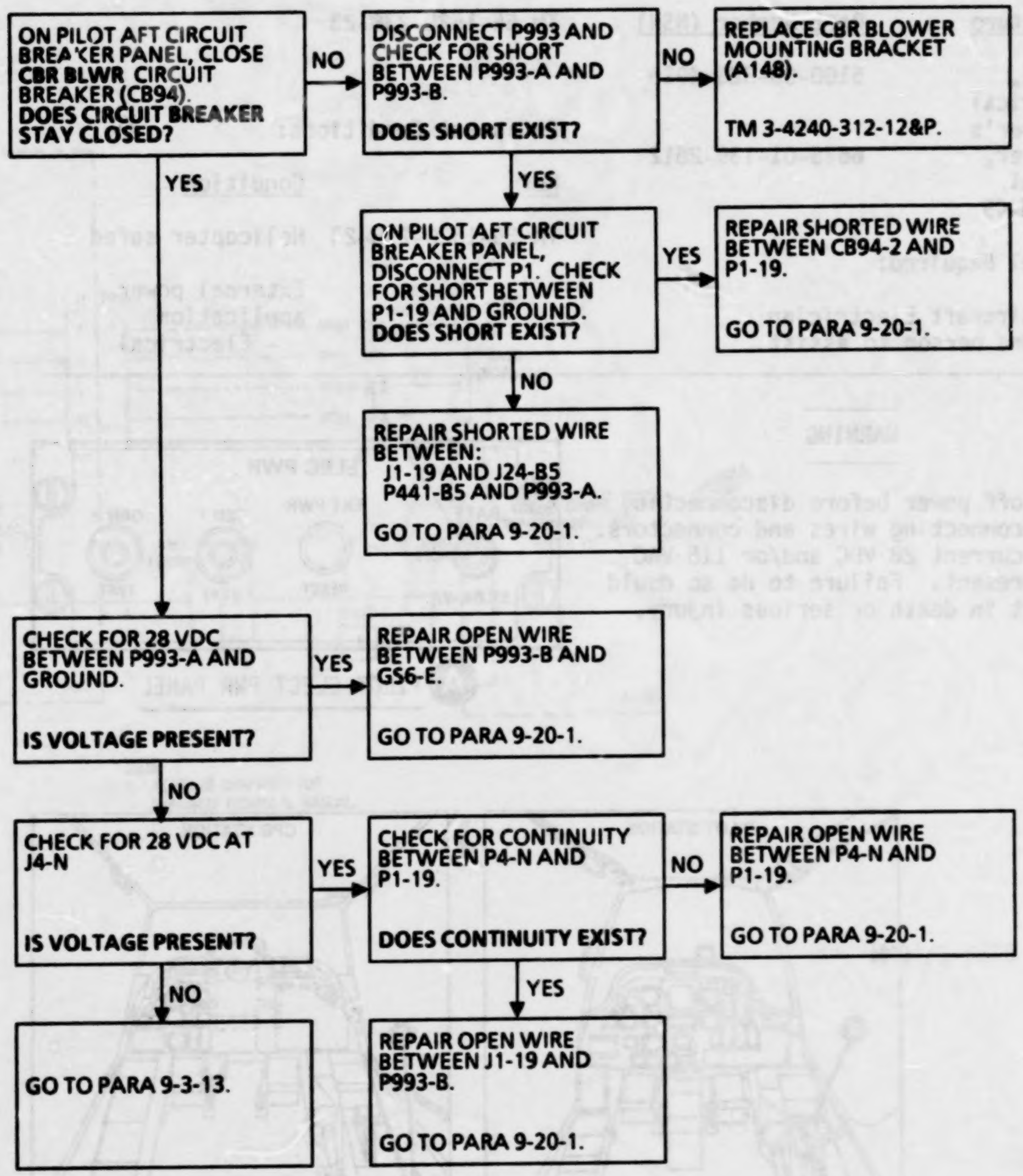
TM 55-1520-238-23
TM 3-4240-312-12&P

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON PILOT AFT CIRCUIT BREAKER PANEL, CLOSE CBR BLWR CIRCUIT BREAKER (CB94). DOES CIRCUIT BREAKER STAY CLOSED?

- NO: DISCONNECT P993 AND CHECK FOR SHORT BETWEEN P993-A AND P993-B. DOES SHORT EXIST?
  - NO: REPLACE CBR BLOWER MOUNTING BRACKET (A148). TM 3-4240-312-12&P.
  - YES: ON PILOT AFT CIRCUIT BREAKER PANEL, DISCONNECT P1. CHECK FOR SHORT BETWEEN P1-19 AND GROUND. DOES SHORT EXIST?
    - YES: REPAIR SHORTED WIRE BETWEEN CB94-2 AND P1-19. GO TO PARA 9-20-1.
    - NO: REPAIR SHORTED WIRE BETWEEN: J1-19 AND J24-B5 P441-B5 AND P993-A. GO TO PARA 9-20-1.
- YES: CHECK FOR 28 VDC BETWEEN P993-A AND GROUND. IS VOLTAGE PRESENT?
  - YES: REPAIR OPEN WIRE BETWEEN P993-B AND GS6-E. GO TO PARA 9-20-1.
  - NO: CHECK FOR 28 VDC AT J4-N. IS VOLTAGE PRESENT?
    - YES: CHECK FOR CONTINUITY BETWEEN P4-N AND P1-19. DOES CONTINUITY EXIST?
      - NO: REPAIR OPEN WIRE BETWEEN P4-N AND P1-19. GO TO PARA 9-20-1.
      - YES: REPAIR OPEN WIRE BETWEEN J1-19 AND P993-B. GO TO PARA 9-20-1.
    - NO: GO TO PARA 9-3-13.

END OF TASK

9-21-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - CPG STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

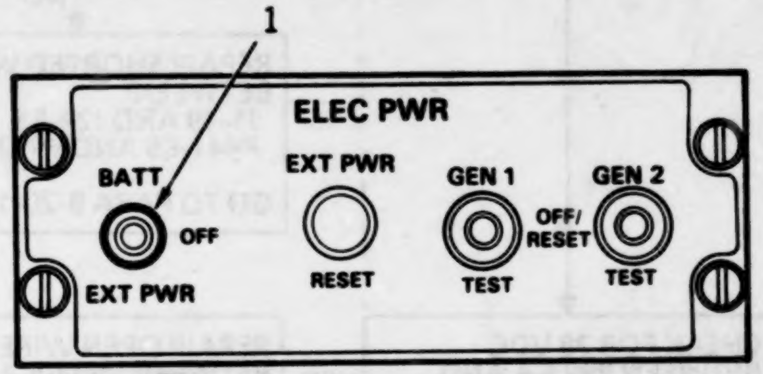
TM 55-1520-238-23

Equipment Conditions:

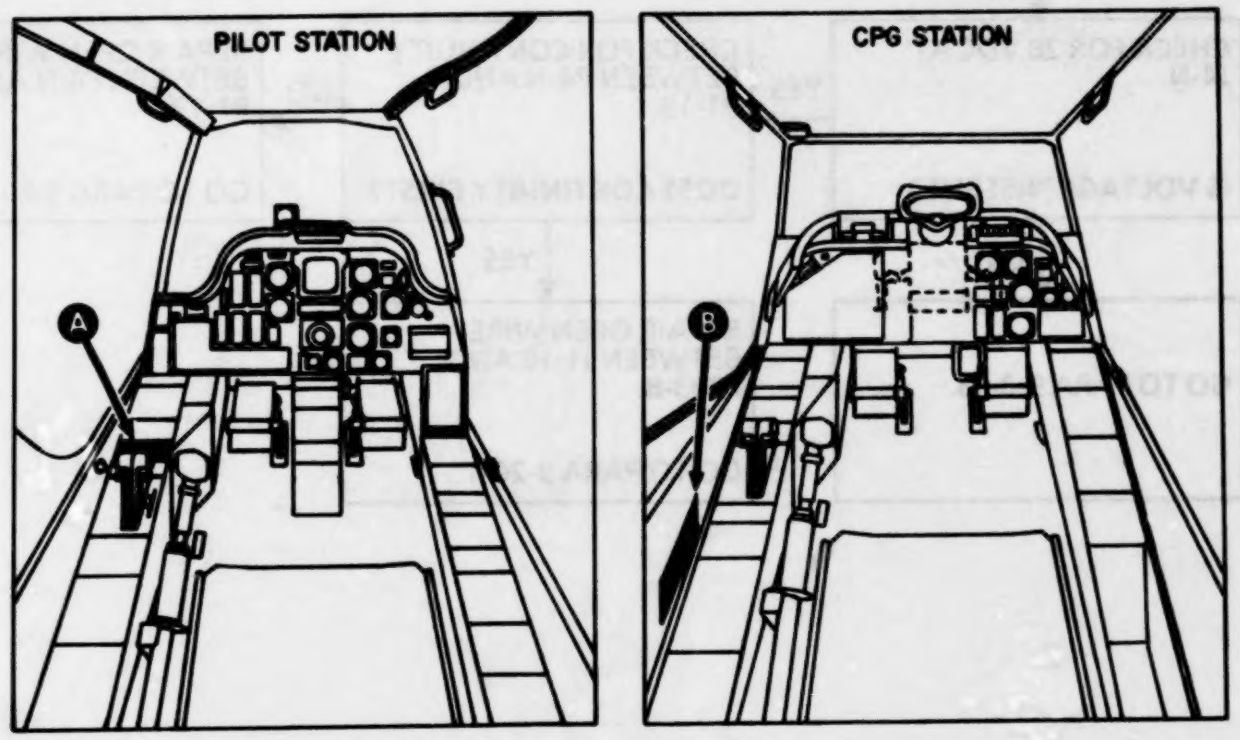
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



A PILOT ELECT PWR PANEL



A. Disconnect P763.

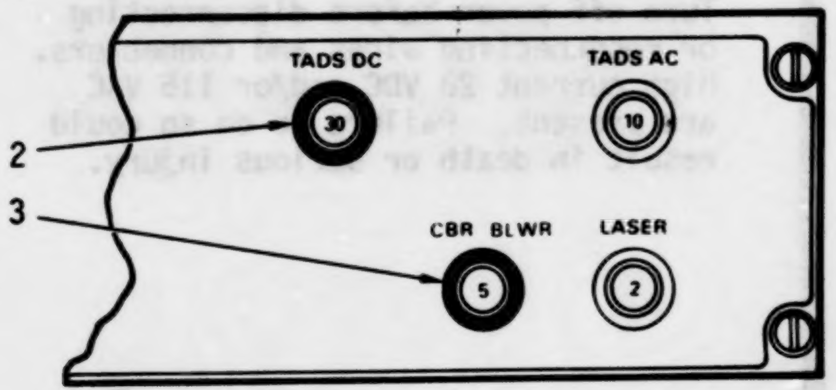
B. Complete operational check as follows:

TASK	RESULT
1. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
2. Check for 28 VDC at P763-D.	If 28 VDC is not present, go to para 9-21-4.
3. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF and connect P763.	
4. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
5. On CPG circuit breaker panel no. 2, check that TADS DC (CB2) (2) and CBR BLWR (CB5) (3) circuit breakers are closed.	If CB2 (2) does not stay closed, go to para 9-21-5. If CB5 (3) does not stay closed, go to para 9-21-6.
6. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF and disconnect P761 and P997.	
7. With BATT/EXT PWR switch (1) set to EXT PWR, check for 28 VDC to TADS/PNVS turret at J1-C, -G, -L, -M.	If 28 VDC is not present, go to para 9-21-5.
8. Check for 28 VDC to CBR blower between P997-A and -B.	If 28 VDC is not present, go to para 9-21-6.

C. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.

D. Reconnect P761 and P997.

E. Remove external power - Electrical (TM 55-1520-238-23).

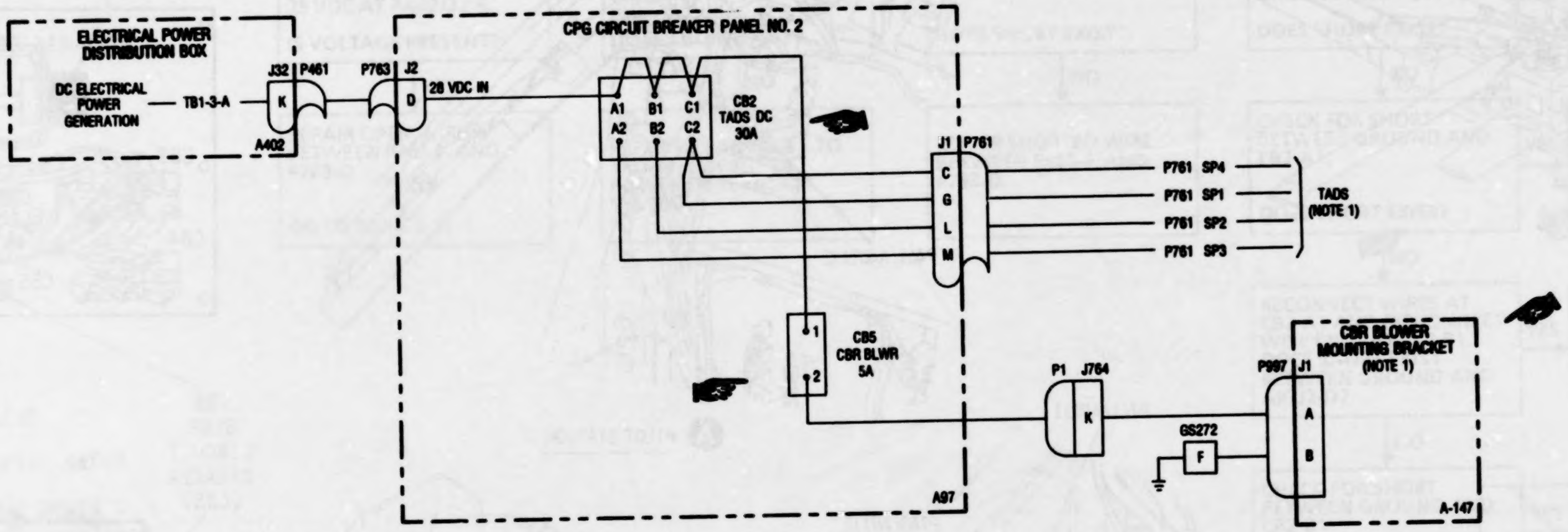


B CPG CIRCUIT BREAKER PANEL NO.2

MM04/1-1011C

END OF TASK

9-21-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - CPG STATION) - INTERCONNECT DIAGRAM

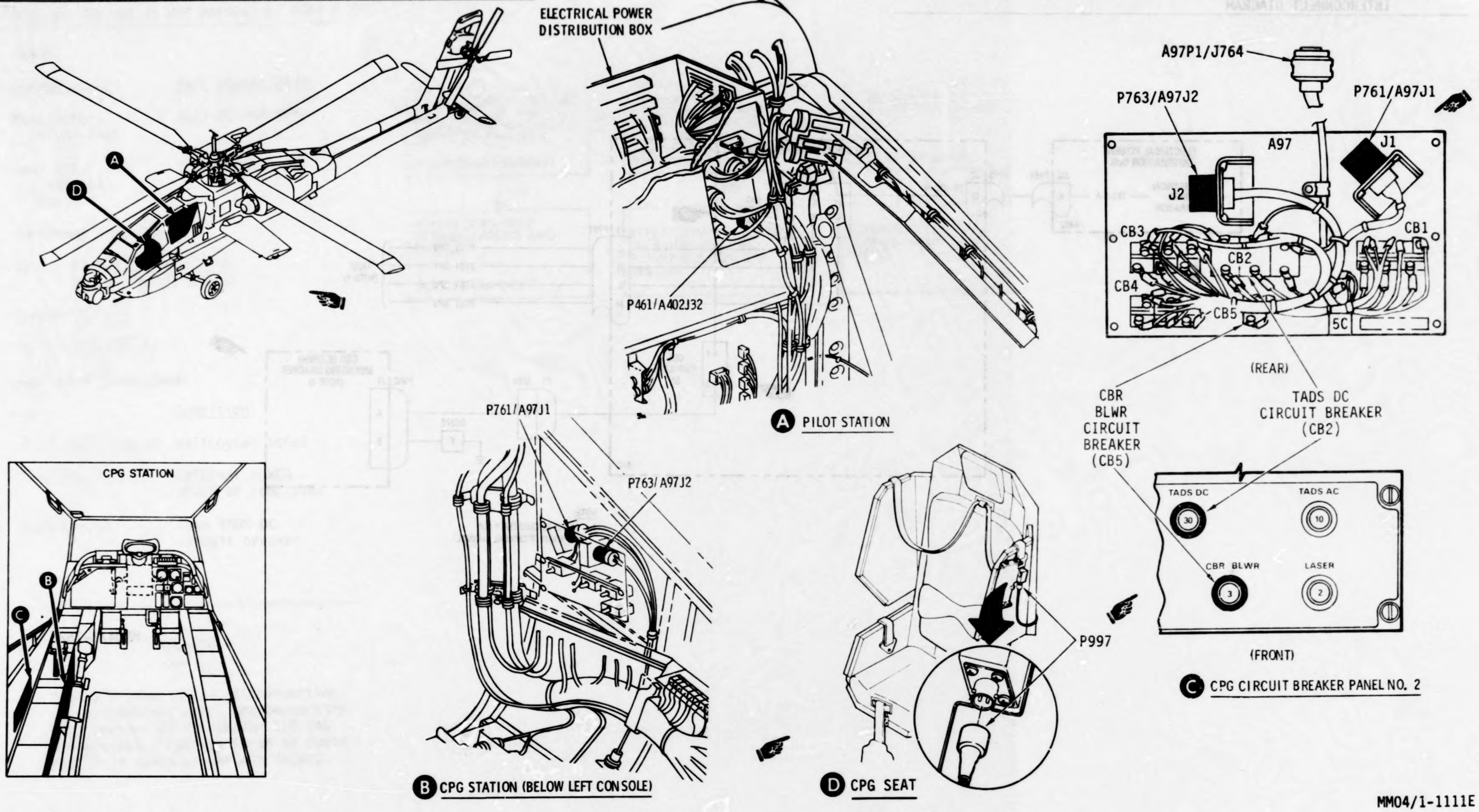

ELECTRICAL POWER DISTRIBUTION BOX
DC ELECTRICAL POWER GENERATION
TB1-3-A
J32
P461
K
A402
P763
J2
D
28 VDC IN
CPG CIRCUIT BREAKER PANEL NO. 2
A1
B1
C1
A2
B2
C2
CB2
TADS DC
30A
J1
P761
C
G
L
M
P761 SP4
P761 SP1
P761 SP2
P761 SP3
TADS
(NOTE 1)
1
2
CB5
CBR BLWR
5A
A97
P1
J764
K
GS272
F
CBR BLOWER MOUNTING BRACKET
(NOTE 1)
P997
J1
A
B
A-147

NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-762B

9-21-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - CPG STATION) ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
D
CPG STATION
B
C
ELECTRICAL POWER DISTRIBUTION BOX
P461/A402J32
A PILOT STATION
P761/A97J1
P763/A97J2
B CPG STATION (BELOW LEFT CONSOLE)
P997
D CPG SEAT
A97P1/J764
P763/A97J2
P761/A97J1
A97
J1
J2
CB3
CB2
CB1
CB4
CB5
5C
(REAR)
CBR BLWR CIRCUIT BREAKER (CB5)
TADS DC CIRCUIT BREAKER (CB2)
TADS DC
30
TADS AC
10
CBR BLWR
3
LASER
2
(FRONT)
C CPG CIRCUIT BREAKER PANEL NO. 2

MM04/1-1111E

END OF TASK

9-21-4. 28 VDC IS NOT PRESENT AT P763-D

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

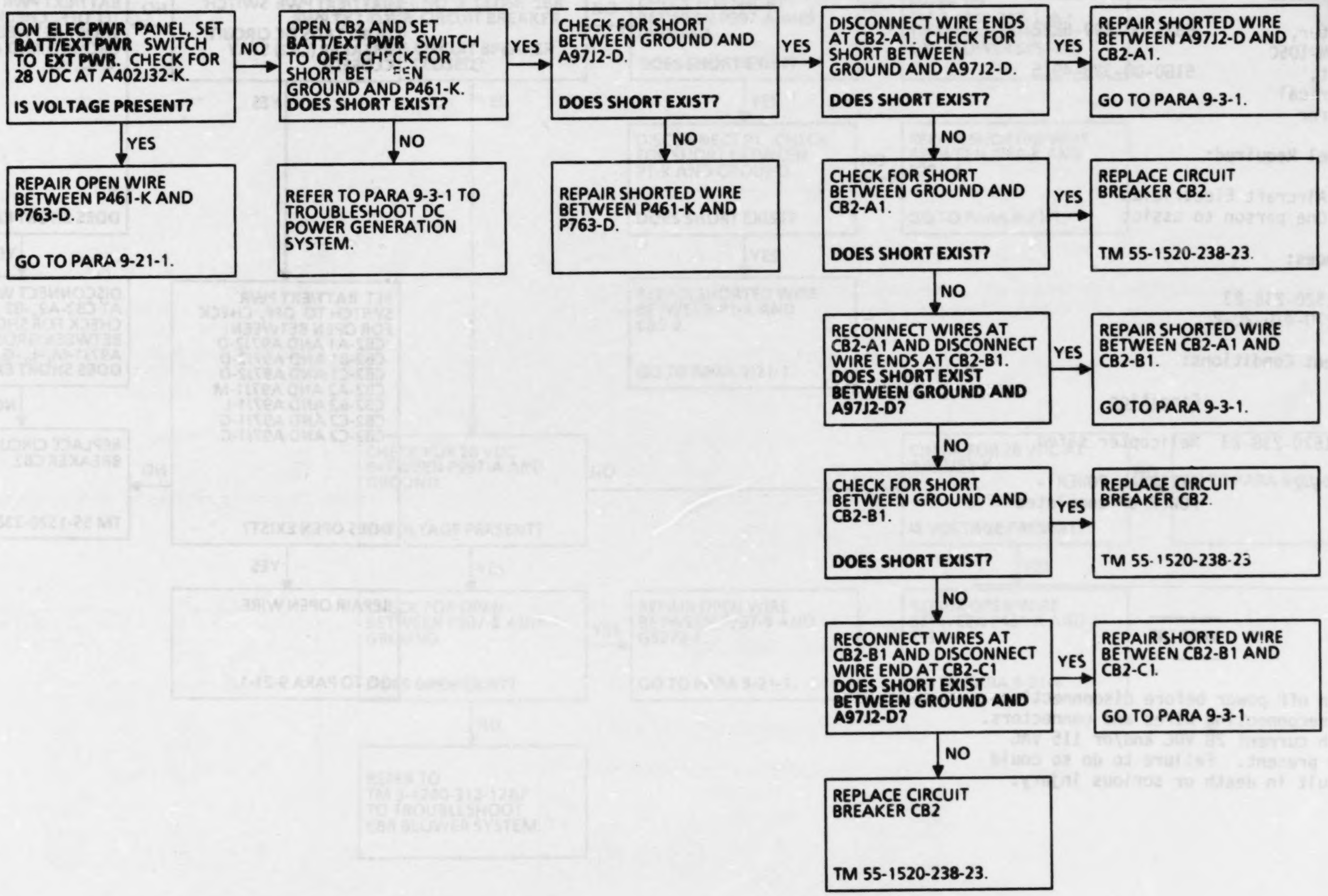
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-21-1	Open TADS DC circuit breaker

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. CHECK FOR 28 VDC AT A402J32-K.
IS VOLTAGE PRESENT?

REPAIR OPEN WIRE BETWEEN P461-K AND P763-D.
GO TO PARA 9-21-1.

OPEN CB2 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P461-K.
DOES SHORT EXIST?

REFER TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION SYSTEM.

CHECK FOR SHORT BETWEEN GROUND AND A97J2-D.
DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN P461-K AND P763-D.

DISCONNECT WIRE ENDS AT CB2-A1. CHECK FOR SHORT BETWEEN GROUND AND A97J2-D.
DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN A97J2-D AND CB2-A1.
GO TO PARA 9-3-1.

CHECK FOR SHORT BETWEEN GROUND AND CB2-A1.
DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB2.
TM 55-1520-238-23.

RECONNECT WIRES AT CB2-A1 AND DISCONNECT WIRE ENDS AT CB2-B1. DOES SHORT EXIST BETWEEN GROUND AND A97J2-D?

REPAIR SHORTED WIRE BETWEEN CB2-A1 AND CB2-B1.
GO TO PARA 9-3-1.

CHECK FOR SHORT BETWEEN GROUND AND CB2-B1.
DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB2.
TM 55-1520-238-23

RECONNECT WIRES AT CB2-B1 AND DISCONNECT WIRE END AT CB2-C1 DOES SHORT EXIST BETWEEN GROUND AND A97J2-D?

REPAIR SHORTED WIRE BETWEEN CB2-B1 AND CB2-C1.
GO TO PARA 9-3-1.

REPLACE CIRCUIT BREAKER CB2
TM 55-1520-238-23.

END OF TASK

9-21-5. TADS DC CIRCUIT BREAKER (CB2) - DOES NOT STAY CLOSED OR 28 VDC TO TADS/PNVS TURRET IS NOT PRESENT AT A97J1-M, -L, -G, -C

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

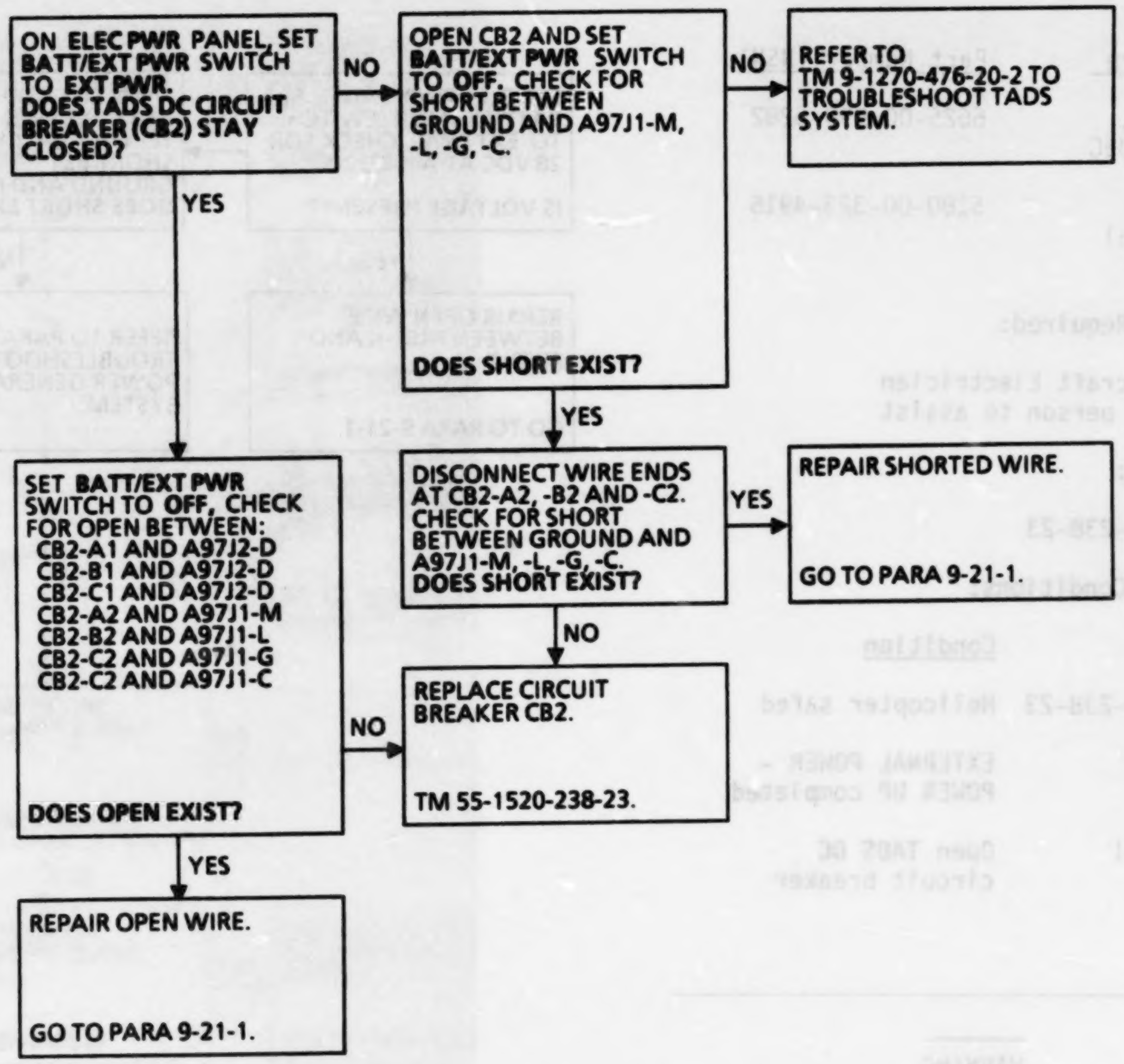
TM 55-1520-238-23
TM 9-1270-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES TADS DC CIRCUIT BREAKER (CB2) STAY CLOSED?

OPEN CB2 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A97J1-M, -L, -G, -C. DOES SHORT EXIST?

REFER TO TM 9-1270-476-20-2 TO TROUBLESHOOT TADS SYSTEM.

SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN:
CB2-A1 AND A97J2-D
CB2-B1 AND A97J2-D
CB2-C1 AND A97J2-D
CB2-A2 AND A97J1-M
CB2-B2 AND A97J1-L
CB2-C2 AND A97J1-G
CB2-C2 AND A97J1-C
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB2-A2, -B2 AND -C2. CHECK FOR SHORT BETWEEN GROUND AND A97J1-M, -L, -G, -C. DOES SHORT EXIST?

REPAIR SHORTED WIRE. GO TO PARA 9-21-1.

REPLACE CIRCUIT BREAKER CB2. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-21-1.

END OF TASK

9-21-6. CPG CBR BLWR CIRCUIT BREAKER (CB5) - DOES NOT STAY CLOSED OR 28 VDC IS NOT PRESENT BETWEEN P997-A AND P997-B

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

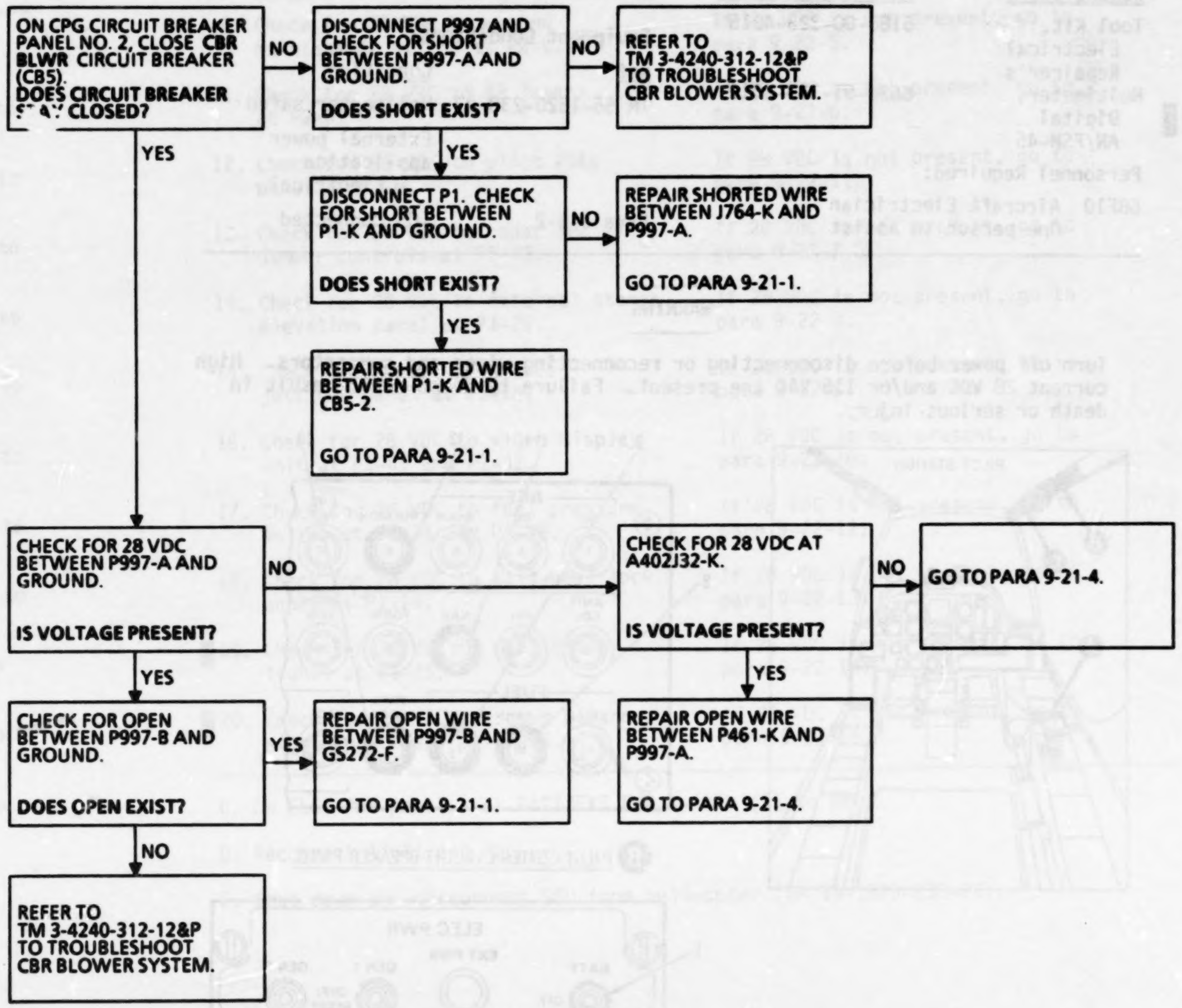
TM 55-1520-238-23
TM 3-4240-312-12&P

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG CIRCUIT BREAKER PANEL NO. 2, CLOSE CBR BLWR CIRCUIT BREAKER (CB5). DOES CIRCUIT BREAKER STAY CLOSED?
NO
DISCONNECT P997 AND CHECK FOR SHORT BETWEEN P997-A AND GROUND. DOES SHORT EXIST?
NO
REFER TO TM 3-4240-312-12&P TO TROUBLESHOOT CBR BLOWER SYSTEM.
YES
DISCONNECT P1. CHECK FOR SHORT BETWEEN P1-K AND GROUND. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN J764-K AND P997-A. GO TO PARA 9-21-1.
YES
REPAIR SHORTED WIRE BETWEEN P1-K AND CB5-2. GO TO PARA 9-21-1.
YES
CHECK FOR 28 VDC BETWEEN P997-A AND GROUND. IS VOLTAGE PRESENT?
NO
CHECK FOR 28 VDC AT A402J32-K. IS VOLTAGE PRESENT?
NO
GO TO PARA 9-21-4.
YES
REPAIR OPEN WIRE BETWEEN P461-K AND P997-A. GO TO PARA 9-21-4.
YES
CHECK FOR OPEN BETWEEN P997-B AND GROUND. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN P997-B AND GS272-F. GO TO PARA 9-21-1.
NO
REFER TO TM 3-4240-312-12&P TO TROUBLESHOOT CBR BLOWER SYSTEM.

END OF TASK

9-22-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 2 - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

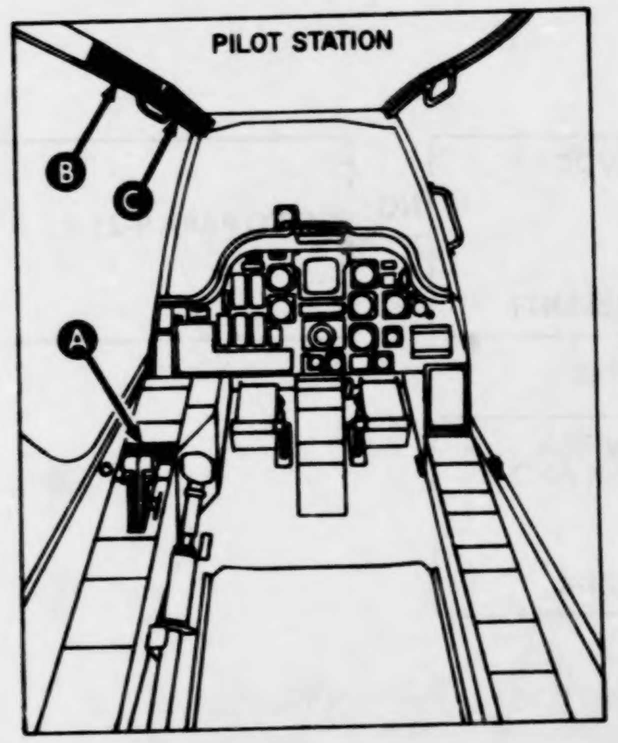
TM 55-1520-238-23

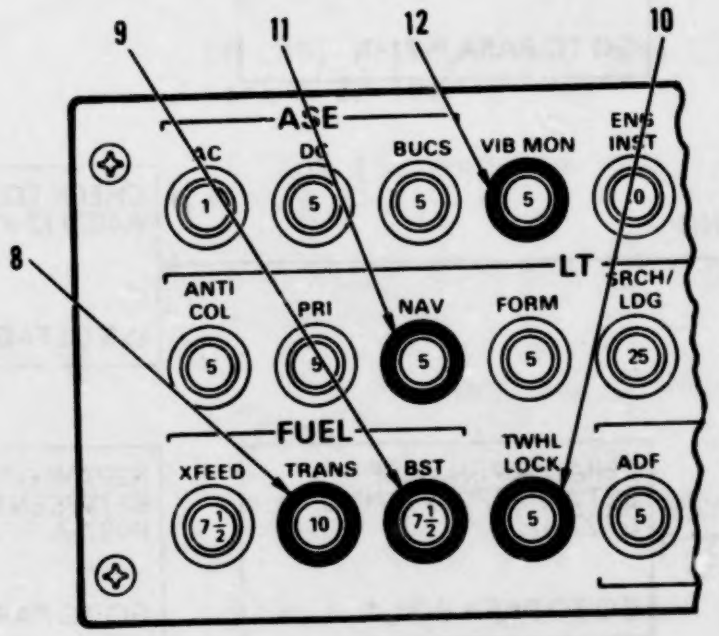
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
Para 1-3-2	ICS connected

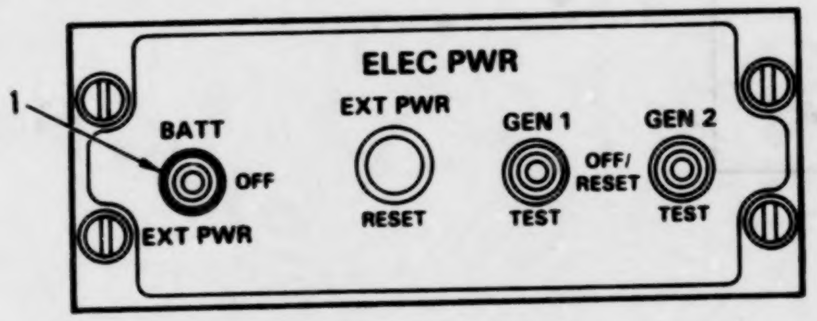
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


PILOT STATION
B
C
A


9
11
12
10
8
ASE
AC
DC
BUCS
VIB MON
ENG INST
1
5
5
5
0
LT
ANTI COL
PRI
NAV
FORM
SRCH/LDG
5
5
5
5
25
FUEL
XFEED
TRANS
BST
TWHL LOCK
ADF
7½
10
7½
5
5

B PILOT CENTER CIRCUIT BREAKER PANEL

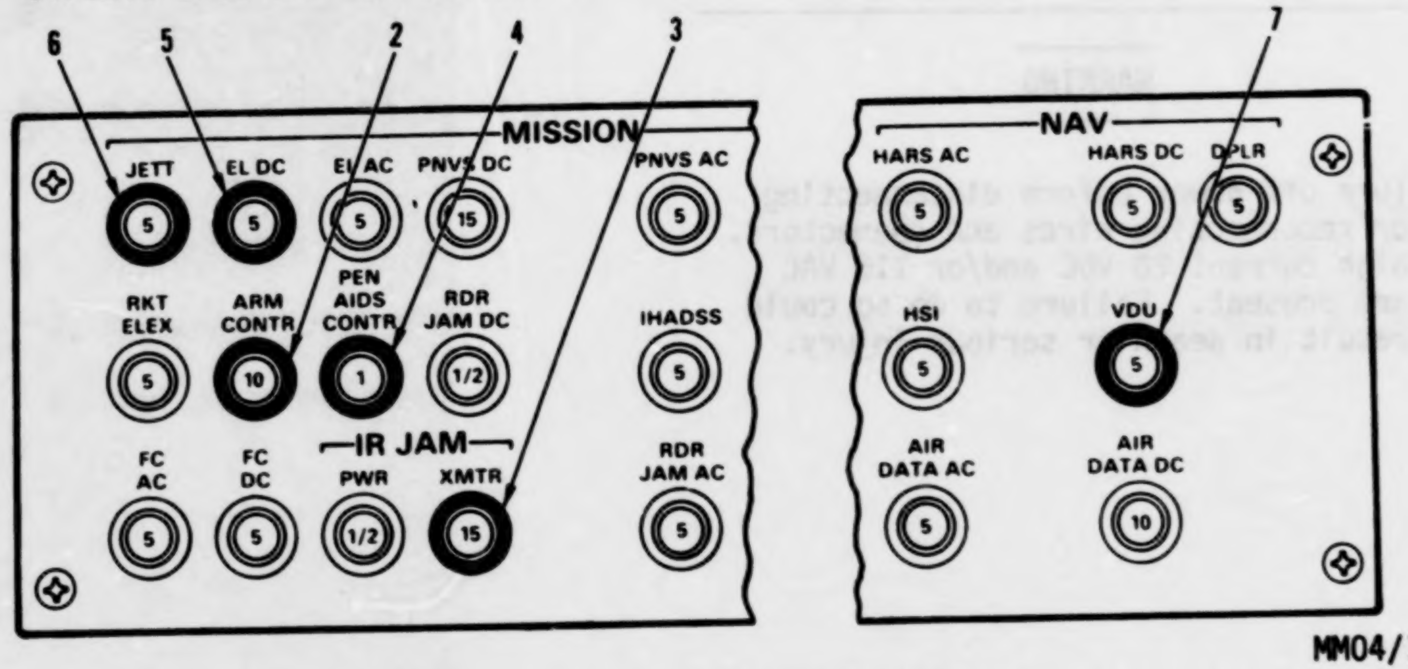

1
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
OFF/RESET
TEST
GEN 2
TEST

A PILOT ELEC PWR PANEL

A. Disconnect A76P4.

B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P4-J and -G.	If short circuit condition exists, go to para 9-22-4.
2. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
3. Check for 28 VDC at A402J4-J and -G.	If 28 VDC is not present, go to para 9-3-1.
4. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **OFF** and connect A76P4.	
5. On pilot circuit breaker panel check that the: **MISSION ARM CONTR** (CB46) (2), **IR JAM XMTR** (CB66) (3), **MISSION PEN AIDS CONTR** (CB49) (4), **MISSION EL DC** (CB93) (5), **MISSION JETT** (CB89) (6), **NAV VDU** (CB91) (7), **FUEL TRANS** (CB56) (8), **FUEL BST** (CB57) (9), **TWHL LOCK** (CB59) (10), **LT NAV** (CB73) (11), and **VIB MON** (CB79) (12) circuit breakers are closed.	


6
5
2
4
3
7
MISSION
JETT
EL DC
EL AC
PNVS DC
PNVS AC
5
5
5
15
5
RKT ELEX
ARM CONTR
PEN AIDS CONTR
RDR JAM DC
IHADSS
5
10
1
1/2
5
IR JAM
FC AC
FC DC
PWR
XMTR
RDR JAM AC
5
5
1/2
15
5
NAV
HARS AC
HARS DC
DPLR
5
5
5
HSI
VDU
5
5
AIR DATA AC
AIR DATA DC
5
10

MM04/1-1012B

C PILOT FORWARD CIRCUIT BREAKER PANEL

GO TO NEXT PAGE

* U.S. GOVERNMENT PRINTING OFFICE : 1989 0 - 233-660

9-22-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 2 - PILOT STATION) - OPERATIONAL CHECK (cont)

TASK	RESULT
6. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
7. Check that circuit breakers in step 5 remain closed.	If CB46 (2) does not stay closed, go to para 9-22-5. If CB66 (3) does not stay closed, go to para 9-22-6. If CB49 (4) does not stay closed, go to para 9-22-7. If CB93 (5) does not stay closed, go to para 9-22-8. If CB89 (6) does not stay closed, go to para 9-22-9. If CB91 (7) does not stay closed, go to para 9-22-10. If CB56 (8) does not stay closed, go to para 9-22-11. If CB57 (9) does not stay closed, go to para 9-22-12. If CB59 (10) does not stay closed, go to para 9-22-13. If CB73 (11) does not stay closed, go to para 9-22-14. If CB79 (12) does not stay closed, go to para 9-22-15.
8. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and disconnect A76P1 and P2.	
9. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
10. Check for 28 VDC to ground maintenance switch at P2-E.	If 28 VDC is not present, go to para 9-22-5.
11. Check for 28 VDC to IR jammer at P2-h.	If 28 VDC is not present, go to para 9-22-6.
12. Check for 28 VDC to pilot FUEL panel at P2-D.	If 28 VDC is not present, go to para 9-22-11.
13. Check for 28 VDC to radar and IR jammer controls at P1-49.	If 28 VDC is not present, go to para 9-22-7.
14. Check for 28 VDC to external stores elevation panel at P1-29.	If 28 VDC is not present, go to para 9-22-8.
15. Check for 28 VDC to stores jettison panel at P1-18.	If 28 VDC is not present, go to para 9-22-9.
16. Check for 28 VDC to video display unit at P1-41 and P1-42.	If 28 VDC is not present, go to para 9-22-10.
17. Check for 28 VDC to fuel pressure switch at P1-31 and P1-48.	If 28 VDC is not present, go to para 9-22-12.
18. Check for 28 VDC to tailwheel lock panel at P1-15.	If 28 VDC is not present, go to para 9-22-13.
19. Check for 28 VDC to navigation lights at P1-25.	If 28 VDC is not present, go to para 9-22-14.
20. Check for 28 VDC to rotor balance signal processor at P1-10.	If 28 VDC is not present, go to para 9-22-15.

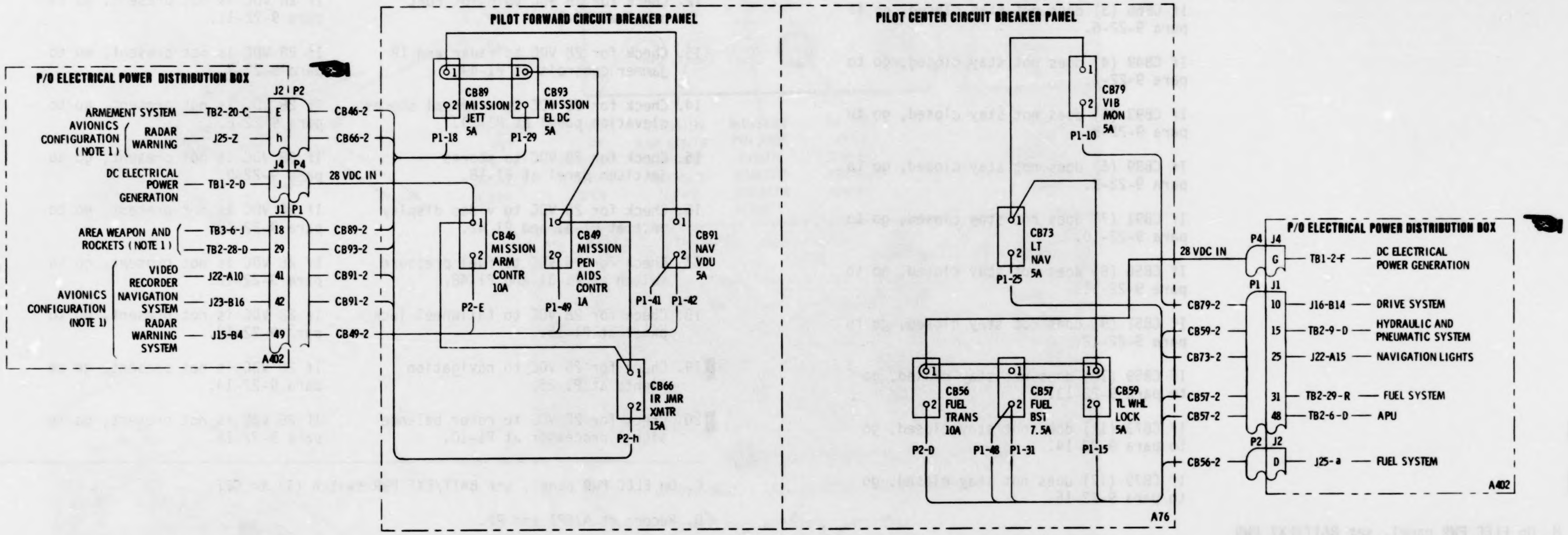
C. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF.**

D. Reconnect A76P1 and P2.

E. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-22-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 2 - PILOT STATION) - INTERCONNECTION DIAGRAM

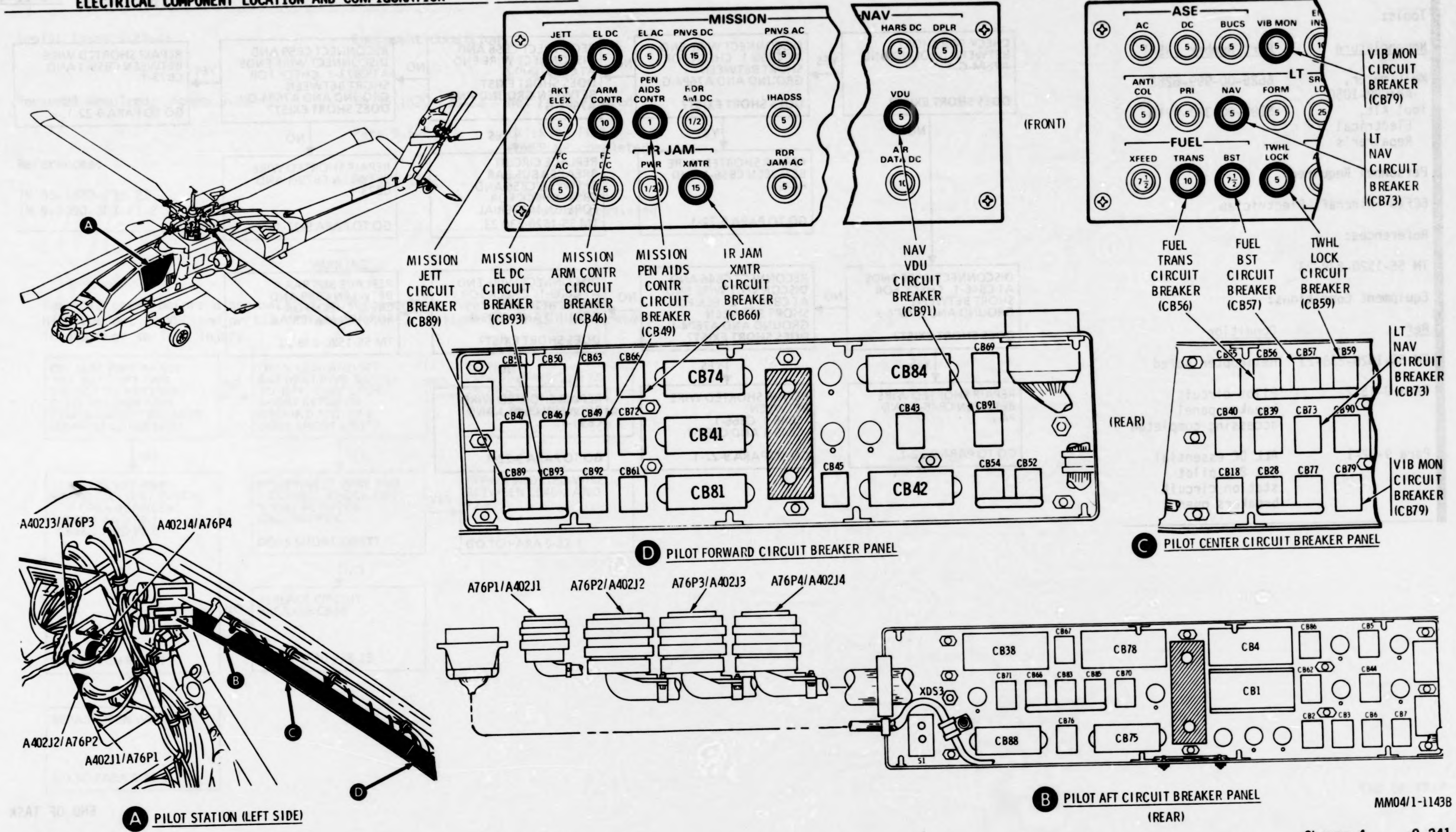

P/O ELECTRICAL POWER DISTRIBUTION BOX
ARMEMENT SYSTEM
TB2-20-C
E
CB46-2
AVIONICS CONFIGURATION (NOTE 1)
RADAR WARNING
J25-Z
h
CB66-2
J2
P2
J4
P4
DC ELECTRICAL POWER GENERATION
TB1-2-D
J
28 VDC IN
J1
P1
AREA WEAPON AND ROCKETS (NOTE 1)
TB3-6-J
18
CB89-2
TB2-28-D
29
CB93-2
VIDEO RECORDER
J22-A10
41
CB91-2
AVIONICS CONFIGURATION (NOTE 1)
NAVIGATION SYSTEM
J23-B16
42
CB91-2
RADAR WARNING SYSTEM
J15-B4
49
CB49-2
A402
PILOT FORWARD CIRCUIT BREAKER PANEL
CB89 MISSION JETT 5A
P1-18
CB93 MISSION EL DC 5A
P1-29
CB46 MISSION ARM CONTR 10A
P2-E
CB49 MISSION PEN AIDS CONTR 1A
P1-49
CB91 NAV VDU 5A
P1-41
P1-42
CB66 IR JMR XMTR 15A
P2-h
1
2
PILOT CENTER CIRCUIT BREAKER PANEL
CB79 VIB MON 5A
P1-10
CB73 LT NAV 5A
P1-25
CB56 FUEL TRANS 10A
P2-D
CB57 FUEL BST 7.5A
P1-48
P1-31
CB59 TL WHL LOCK 5A
P1-15
A76
P/O ELECTRICAL POWER DISTRIBUTION BOX
28 VDC IN
P4
J4
G
TB1-2-F
DC ELECTRICAL POWER GENERATION
P1
J1
CB79-2
10
J16-B14
DRIVE SYSTEM
CB59-2
15
TB2-9-D
HYDRAULIC AND PNEUMATIC SYSTEM
CB73-2
25
J22-A15
NAVIGATION LIGHTS
CB57-2
31
TB2-29-R
FUEL SYSTEM
CB57-2
48
TB2-6-D
APU
P2
J2
CB56-2
D
J25-a
FUEL SYSTEM
A402

NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-765B

9-22-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 2 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
A402J3/A76P3
A402J4/A76P4
A402J2/A76P2
A402J1/A76P1
B
C
D
MISSION
JETT
EL DC
EL AC
PNVS DC
PNVS AC
RKT ELEX
ARM CONTR
PEN AIDS CONTR
FDR 3.0 DC
IHADSS
FC AC
FC DC
IR JAM
PWR
XMTR
RDR JAM AC
NAV
HARS DC
DPLR
VDU
AIR DATA DC
(FRONT)
ASE
AC
DC
BUCS
VIB MON
LT
ANTI COL
PRI
NAV
FORM
FUEL
XFEED
TRANS
BST
TWHL LOCK
MISSION JETT CIRCUIT BREAKER (CB89)
MISSION EL DC CIRCUIT BREAKER (CB93)
MISSION ARM CONTR CIRCUIT BREAKER (CB46)
MISSION PEN AIDS CONTR CIRCUIT BREAKER (CB49)
IR JAM XMTR CIRCUIT BREAKER (CB66)
NAV VDU CIRCUIT BREAKER (CB91)
VIB MON CIRCUIT BREAKER (CB79)
LT NAV CIRCUIT BREAKER (CB73)
FUEL TRANS CIRCUIT BREAKER (CB56)
FUEL BST CIRCUIT BREAKER (CB57)
TWHL LOCK CIRCUIT BREAKER (CB59)
CB51
CB50
CB63
CB64
CB74
CB84
CB69
CB47
CB46
CB49
CB72
CB41
CB43
CB91
CB89
CB93
CB92
CB61
CB81
CB45
CB42
CB54
CB52
(REAR)
CB55
CB56
CB57
CB59
CB40
CB39
CB73
CB90
CB18
CB28
CB77
CB79
LT NAV CIRCUIT BREAKER (CB73)
VIB MON CIRCUIT BREAKER (CB79)
A76P1/A402J1
A76P2/A402J2
A76P3/A402J3
A76P4/A402J4
XDS3
S1
CB38
CB67
CB78
CB4
CB86
CB5
CB71
CB66
CB83
CB85
CB70
CB62
CB44
CB1
CB76
CB88
CB75
CB2
CB3
CB6
CB7

Ⓐ PILOT STATION (LEFT SIDE)

Ⓓ PILOT FORWARD CIRCUIT BREAKER PANEL

Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL

Ⓑ PILOT AFT CIRCUIT BREAKER PANEL
(REAR)

MM04/1-1143B

9-22-4. SHORT EXISTS BETWEEN GROUND AND A76P4-J OR -G

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

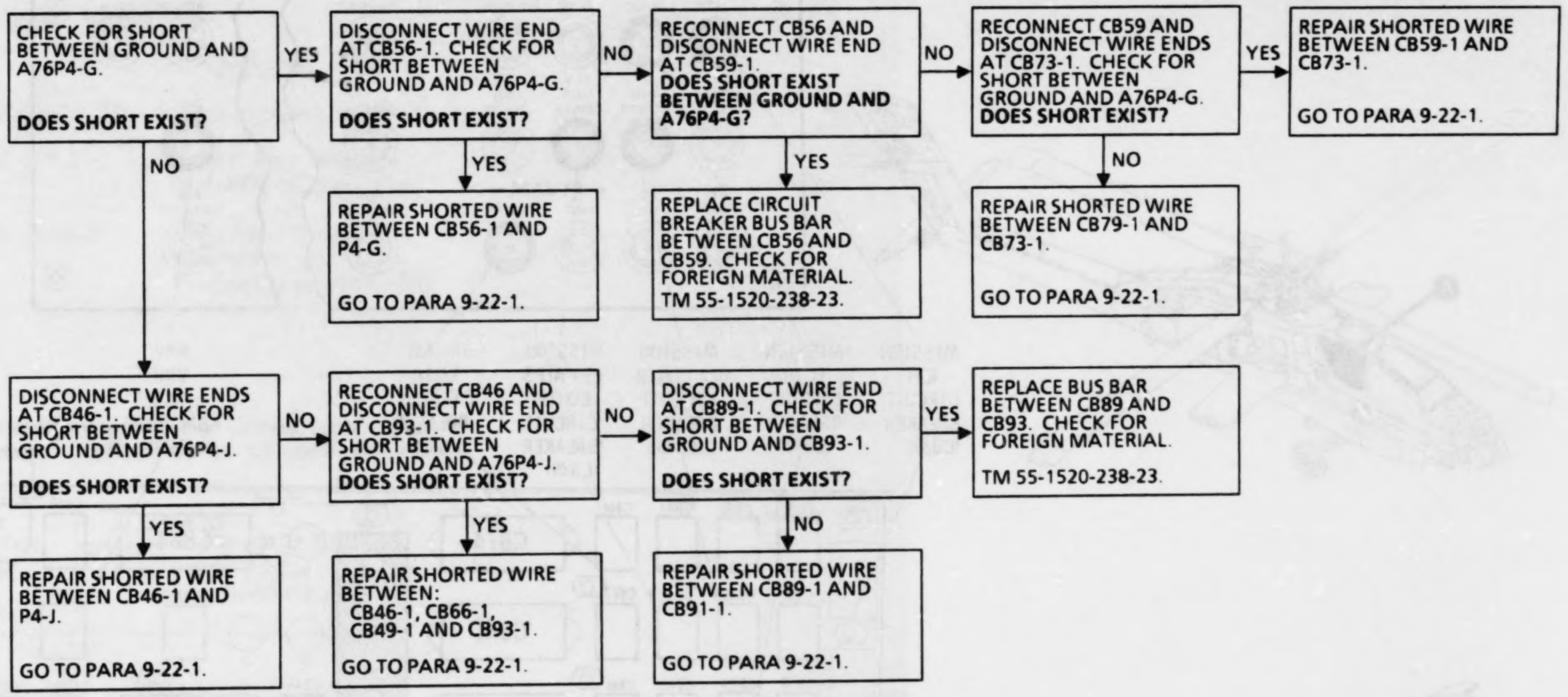
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-22-1	ALL DC essential bus 2 - pilot station circuit breakers open



CHECK FOR SHORT BETWEEN GROUND AND A76P4-G. DOES SHORT EXIST?

DISCONNECT WIRE END AT CB56-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-G. DOES SHORT EXIST?

RECONNECT CB56 AND DISCONNECT WIRE END AT CB59-1. DOES SHORT EXIST BETWEEN GROUND AND A76P4-G?

RECONNECT CB59 AND DISCONNECT WIRE ENDS AT CB73-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-G. DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB59-1 AND CB73-1. GO TO PARA 9-22-1.

REPAIR SHORTED WIRE BETWEEN CB56-1 AND P4-G. GO TO PARA 9-22-1.

REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB56 AND CB59. CHECK FOR FOREIGN MATERIAL. TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN CB79-1 AND CB73-1. GO TO PARA 9-22-1.

DISCONNECT WIRE ENDS AT CB46-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-J. DOES SHORT EXIST?

RECONNECT CB46 AND DISCONNECT WIRE END AT CB93-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-J. DOES SHORT EXIST?

DISCONNECT WIRE END AT CB89-1. CHECK FOR SHORT BETWEEN GROUND AND CB93-1. DOES SHORT EXIST?

REPLACE BUS BAR BETWEEN CB89 AND CB93. CHECK FOR FOREIGN MATERIAL. TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN CB46-1 AND P4-J. GO TO PARA 9-22-1.

REPAIR SHORTED WIRE BETWEEN: CB46-1, CB66-1, CB49-1 AND CB93-1. GO TO PARA 9-22-1.

REPAIR SHORTED WIRE BETWEEN CB89-1 AND CB91-1. GO TO PARA 9-22-1.

END OF TASK

9-22-5. MISSION ARM CONTR CIRCUIT BREAKER (CB46) - DOES NOT STAY CLOSED OR 28 VDC TO GROUND MAINTENANCE SWITCH IS NOT PRESENT AT P2-E

Tools: (para 9-22-4)

Personel Required: (para 9-22-4)

References:

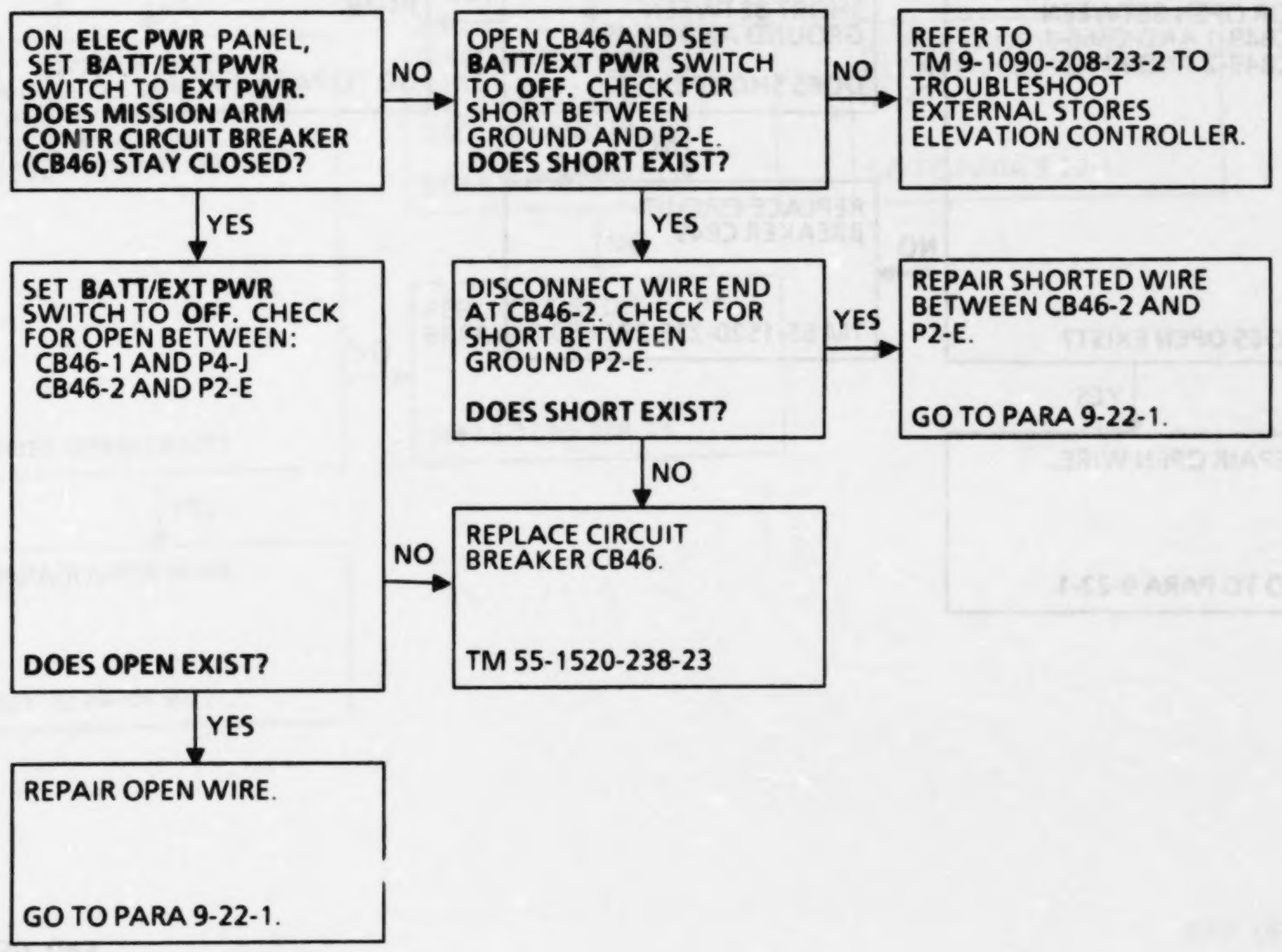
TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION ARM CONTR CIRCUIT BREAKER (CB46) STAY CLOSED?
NO
OPEN CB46 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-E. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT EXTERNAL STORES ELEVATION CONTROLLER.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB46-1 AND P4-J CB46-2 AND P2-E
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB46-2. CHECK FOR SHORT BETWEEN GROUND P2-E.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB46-2 AND P2-E.
GO TO PARA 9-22-1.
NO
NO
REPLACE CIRCUIT BREAKER CB46.
TM 55-1520-238-23
YES
REPAIR OPEN WIRE.
GO TO PARA 9-22-1.

END OF TASK

9-22-6. IR JAM XMTR CIRCUIT BREAKER (CB) - DOES NOT STAY CLOSED OR 28 VDC TO IR JAMMER CONTROL IS NOT PRESENT AT A76P2-h

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

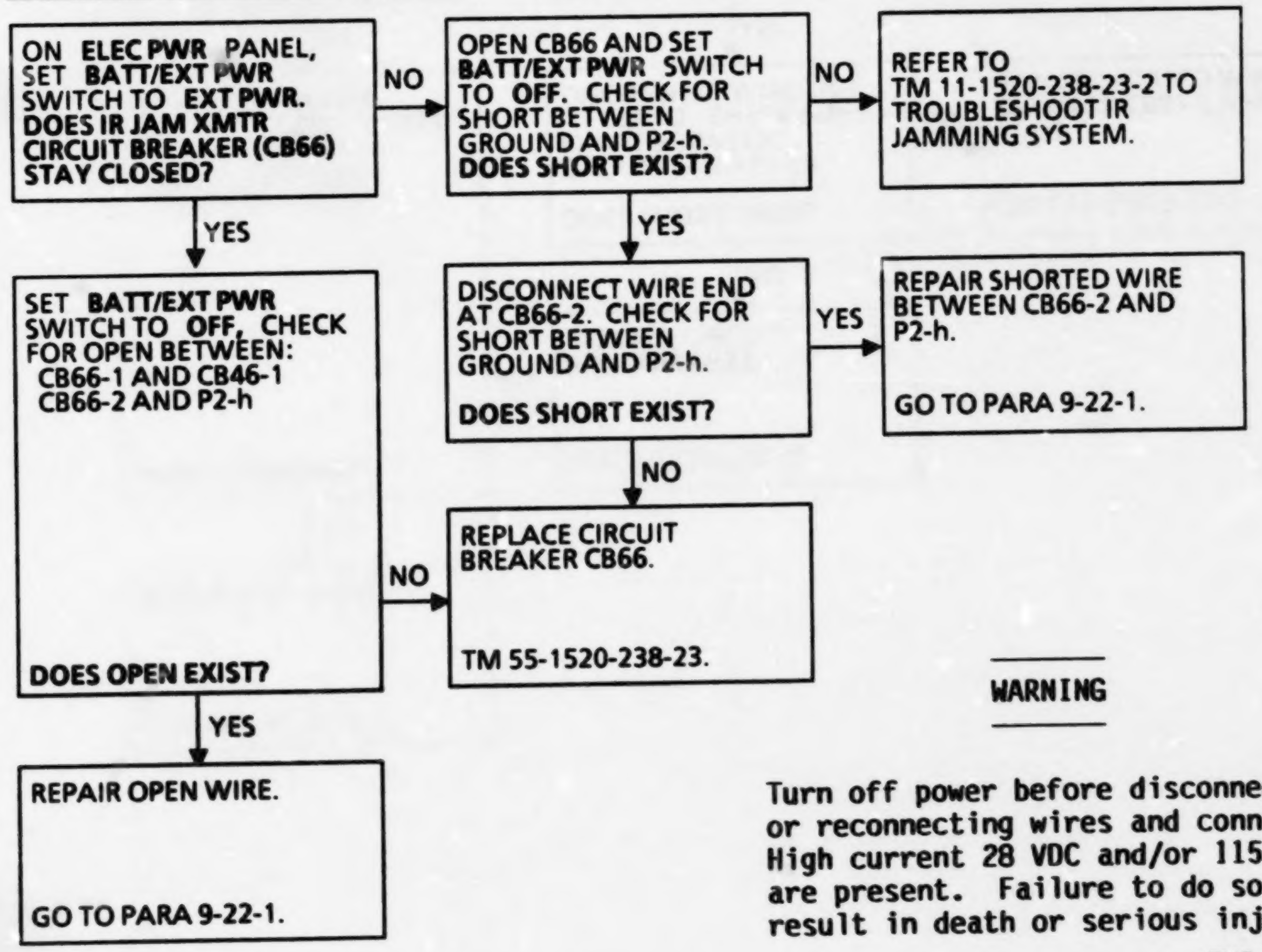
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES IR JAM XMTR CIRCUIT BREAKER (CB66) STAY CLOSED?
NO
OPEN CB66 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-h. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT IR JAMMING SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB66-1 AND CB46-1 CB66-2 AND P2-h
YES
DISCONNECT WIRE END AT CB66-2. CHECK FOR SHORT BETWEEN GROUND AND P2-h.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB66-2 AND P2-h.
GO TO PARA 9-22-1.
NO
REPLACE CIRCUIT BREAKER CB66.
TM 55-1520-238-23.
NO
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-22-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-22-7. MISSION PEN AIDS CONTR CIRCUIT BREAKER (CB49) - DOES NOT STAY CLOSED OR 28 VDC TO RADAR AND IR JAMMER CONTROLS IS NOT PRESENT AT P1-49

Tools: (para 9-22-6)

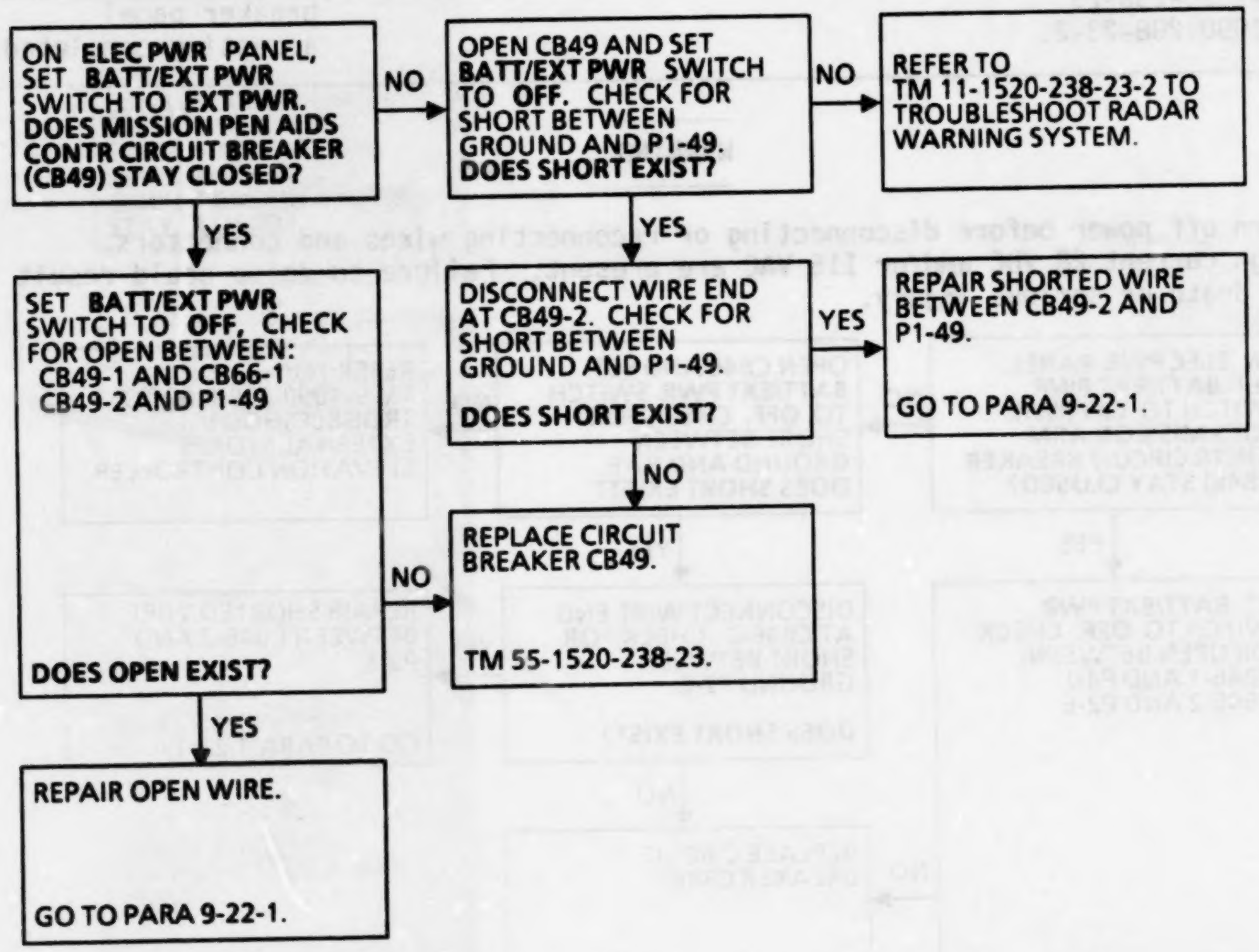
Personnel Required: (para 9-22-6)

References: (para 9-22-6)

Equipment conditions: (para 9-22-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION PEN AIDS CONTR CIRCUIT BREAKER (CB49) STAY CLOSED?
NO
OPEN CB49 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-49. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT RADAR WARNING SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB49-1 AND CB66-1 CB49-2 AND P1-49
YES
DISCONNECT WIRE END AT CB49-2. CHECK FOR SHORT BETWEEN GROUND AND P1-49.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB49-2 AND P1-49.
GO TO PARA 9-22-1.
NO
REPLACE CIRCUIT BREAKER CB49.
TM 55-1520-238-23.
NO
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-22-1.

END OF TASK

9-22-8. MISSION EL DC CIRCUIT BREAKER (CB93) - DOES NOT STAY CLOSED OR 28 VDC TO EXTERNAL STORES ELEVATION PANEL IS NOT PRESENT AT P1-29

Tools: (para 9-22-6)

Personnel Required: (para 9-22-6)

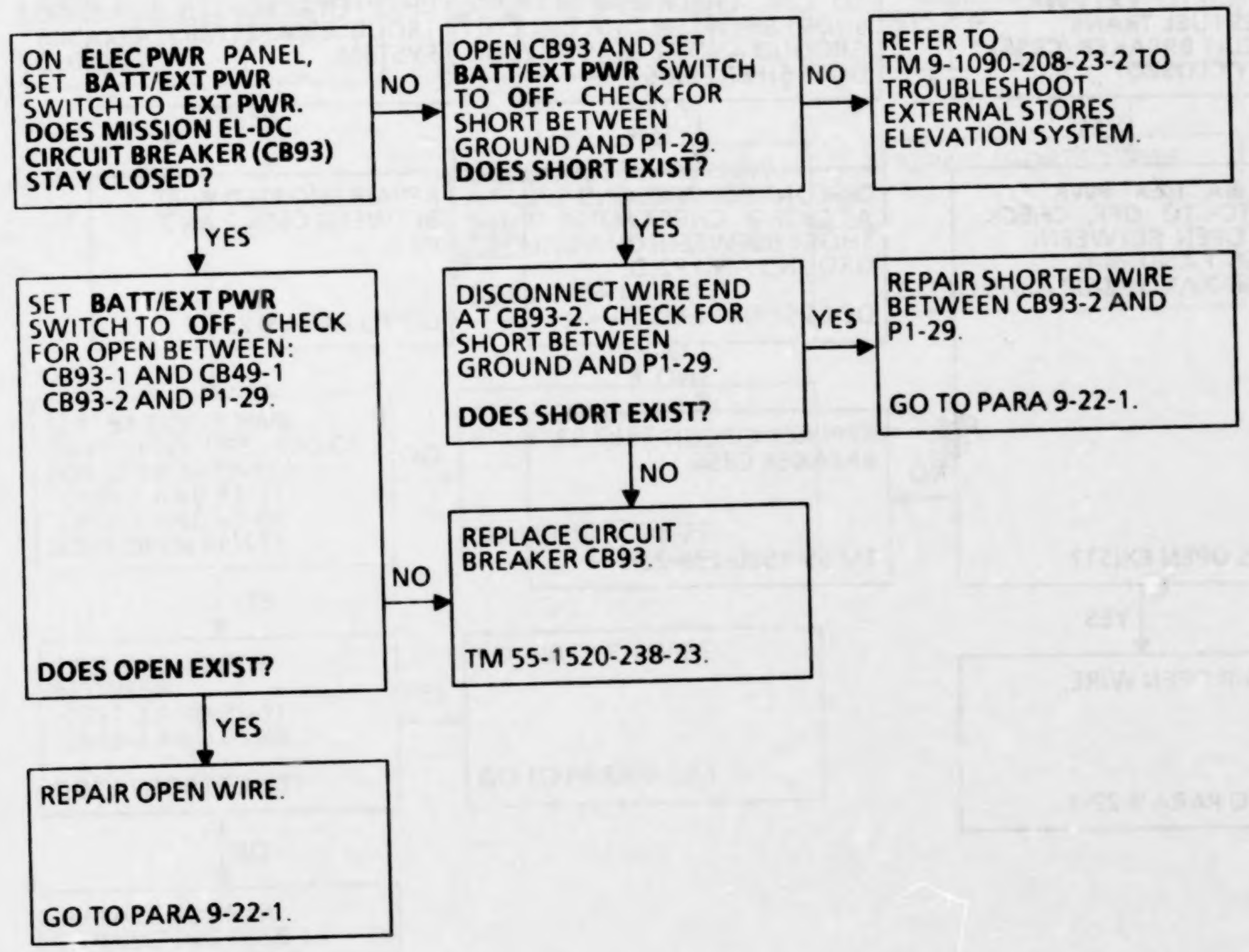
References:

TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions: (para 9-22-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION EL-DC CIRCUIT BREAKER (CB93) STAY CLOSED?
NO
OPEN CB93 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-29. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT EXTERNAL STORES ELEVATION SYSTEM.
YES
DISCONNECT WIRE END AT CB93-2. CHECK FOR SHORT BETWEEN GROUND AND P1-29. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB93-2 AND P1-29. GO TO PARA 9-22-1.
NO
REPLACE CIRCUIT BREAKER CB93. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB93-1 AND CB49-1 CB93-2 AND P1-29. DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-22-1.

END OF TASK

9-22-9. MISSION JETT CIRCUIT BREAKER (CB89) - DOES NOT STAY CLOSED OR 28 VDC TO STORES JETT PANEL IS NOT PRESENT AT P1-18

Tools: (para 9-22-6)

Personnel Required: (para 9-22-6)

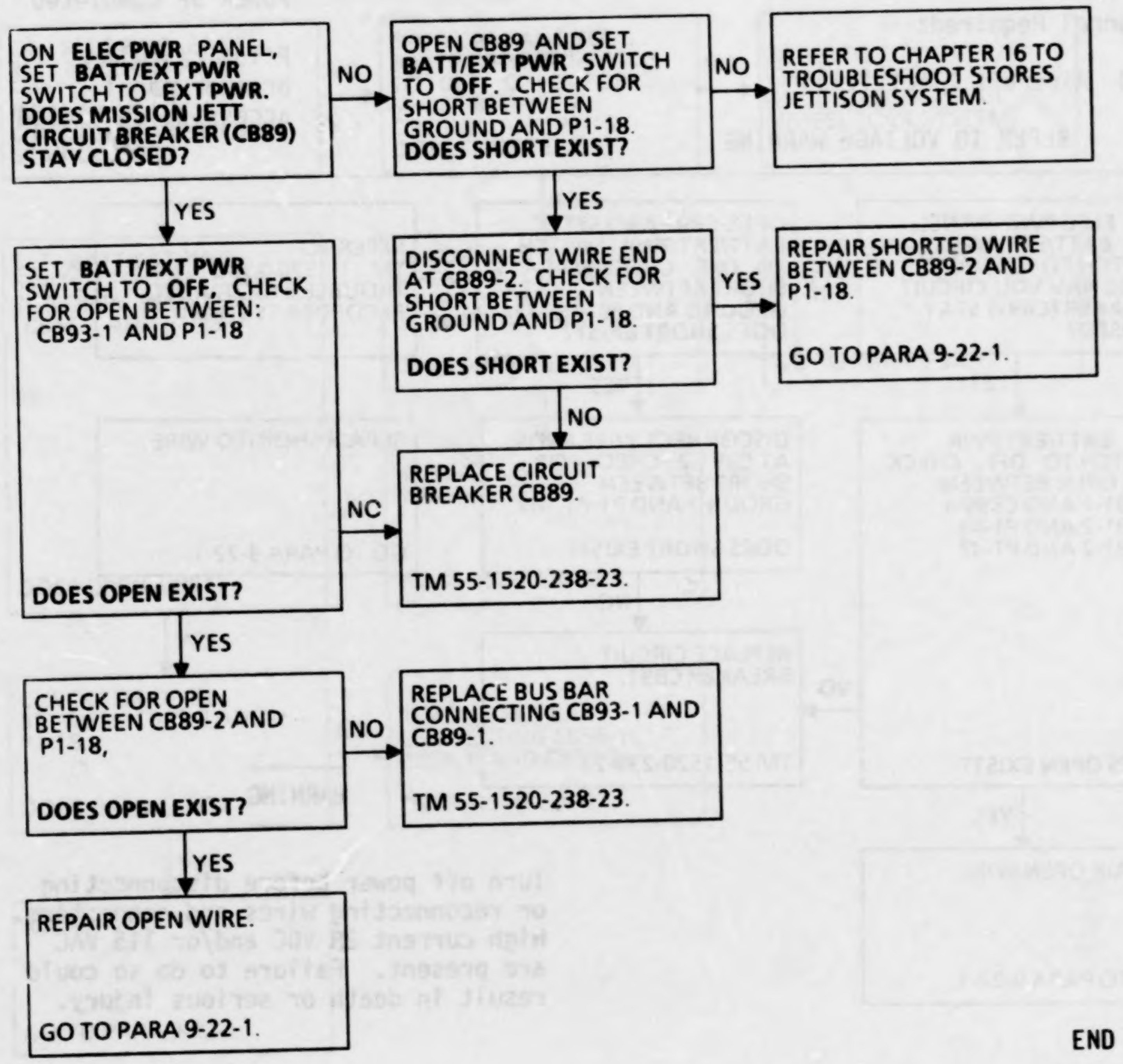
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-22-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION JETT CIRCUIT BREAKER (CB89) STAY CLOSED?
NO
OPEN CB89 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-18. DOES SHORT EXIST?
NO
REFER TO CHAPTER 16 TO TROUBLESHOOT STORES JETTISON SYSTEM.
YES
DISCONNECT WIRE END AT CB89-2. CHECK FOR SHORT BETWEEN GROUND AND P1-18. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB89-2 AND P1-18. GO TO PARA 9-22-1.
NO
REPLACE CIRCUIT BREAKER CB89. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB93-1 AND P1-18 DOES OPEN EXIST?
NC
YES
CHECK FOR OPEN BETWEEN CB89-2 AND P1-18, DOES OPEN EXIST?
NO
REPLACE BUS BAR CONNECTING CB93-1 AND CB89-1. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-22-1.

END OF TASK

9-22-10. NAV VDU CIRCUIT BREAKER (CB91) - DOES NOT STAY CLOSED OR 28 VDC TO VIDEO DISPLAY UNIT IS NOT PRESENT AT P1-41, -42

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

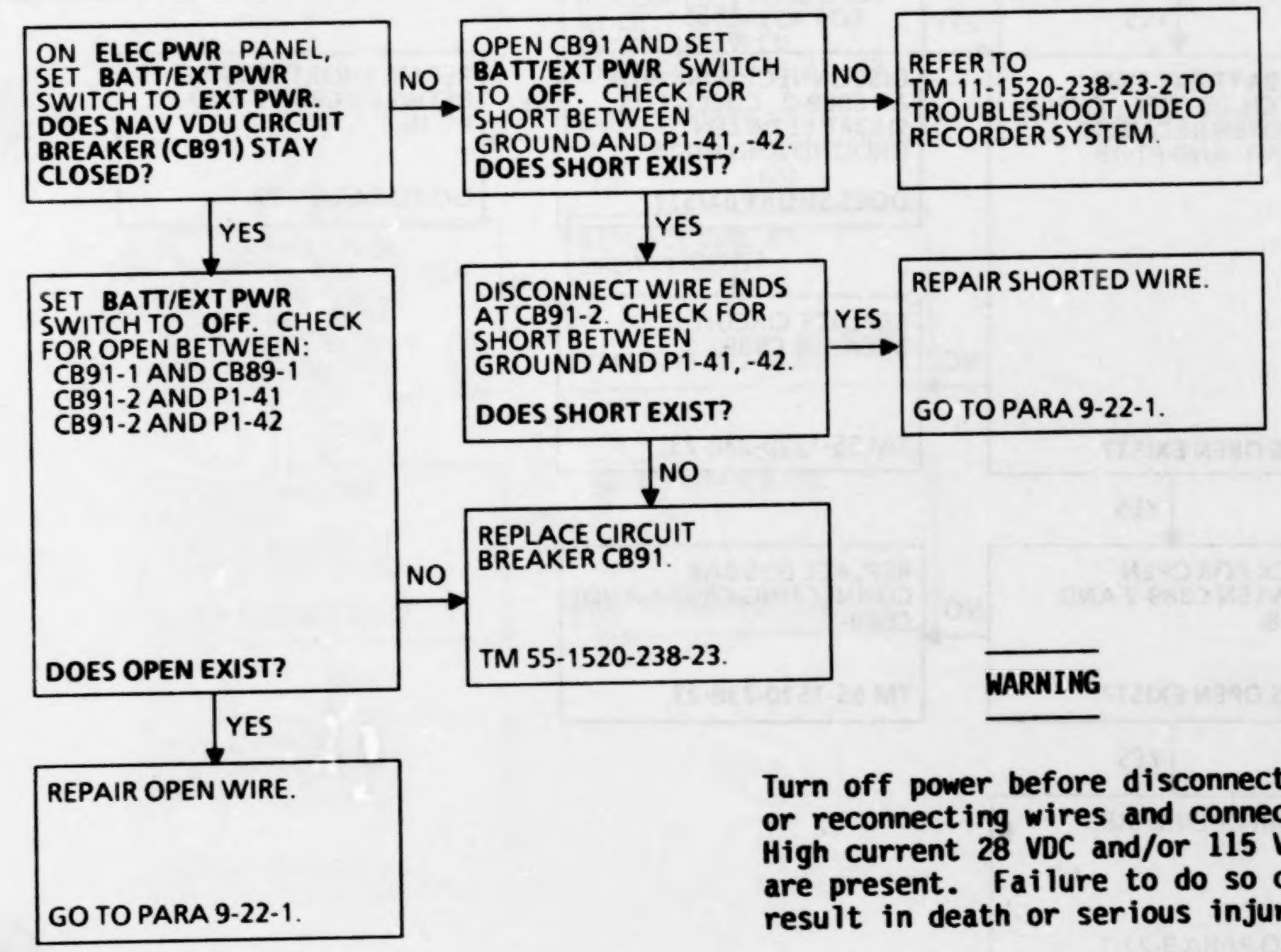
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV VDU CIRCUIT BREAKER (CB91) STAY CLOSED?
NO
OPEN CB91 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-41, -42. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT VIDEO RECORDER SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB91-1 AND CB89-1
CB91-2 AND P1-41
CB91-2 AND P1-42
DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB91-2. CHECK FOR SHORT BETWEEN GROUND AND P1-41, -42.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-22-1.
NO
REPLACE CIRCUIT BREAKER CB91.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-22-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-22-11. FUEL TRANS CIRCUIT BREAKER (CB56) DOES NOT STAY CLOSED OR 28 VDC TO PILOT FUEL PANEL IS NOT PRESENT AT P2-D

Tools: (para 9-22-10)

Personnel Required: (para 9-22-10)

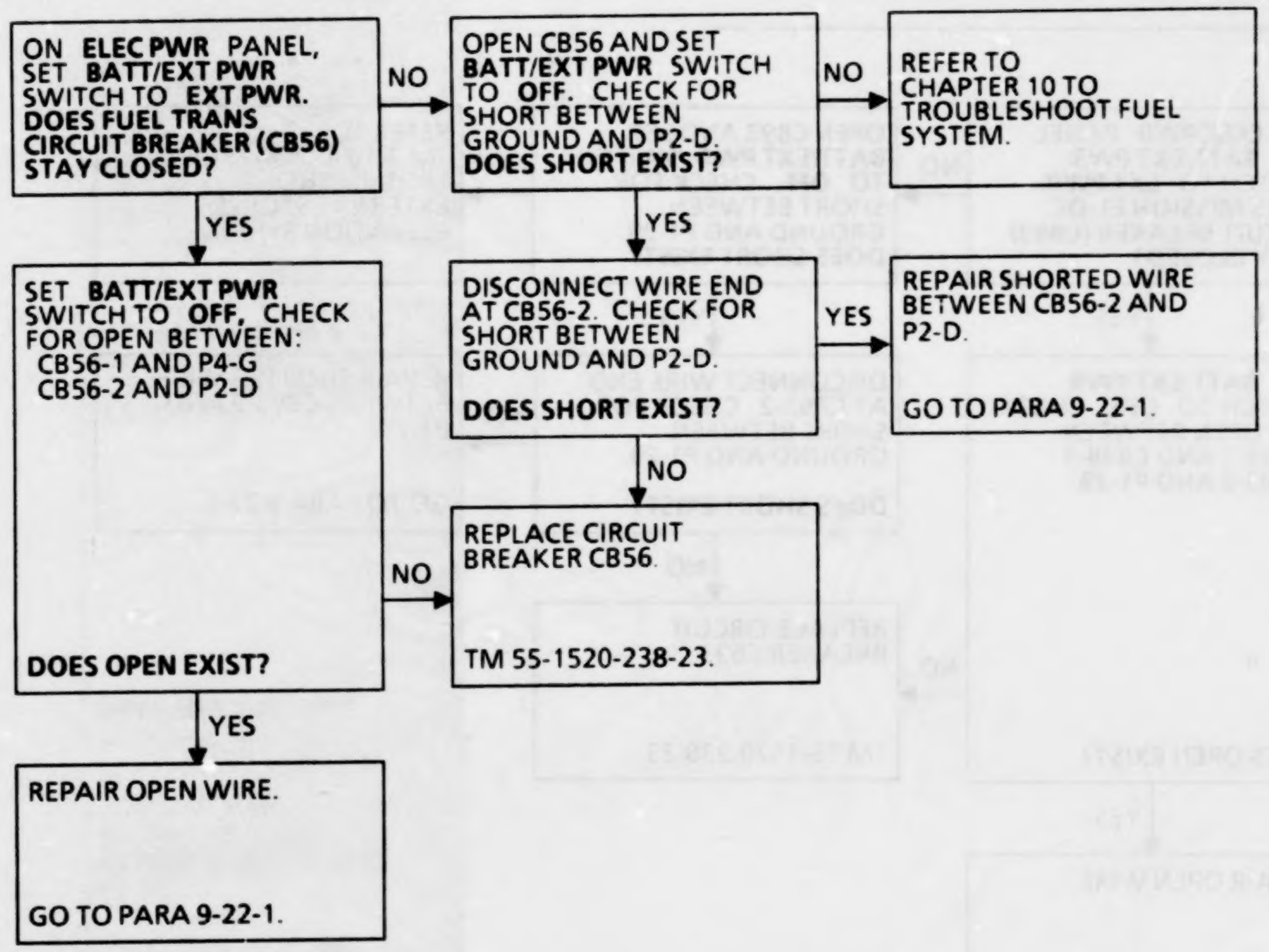
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-22-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FUEL TRANS CIRCUIT BREAKER (CB56) STAY CLOSED?
NO
OPEN CB56 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-D. DOES SHORT EXIST?
NO
REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN:
CB56-1 AND P4-G
CB56-2 AND P2-D
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB56-2. CHECK FOR SHORT BETWEEN GROUND AND P2-D.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB56-2 AND P2-D.
GO TO PARA 9-22-1.
NO
REPLACE CIRCUIT BREAKER CB56.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-22-1.

END OF TASK

9-22-12. FUEL BST CIRCUIT BREAKER (CB57) - DOES NOT STAY CLOSED OR 28 VDC TO FUEL PRESSURE SWITCH IS NOT PRESENT AT P1-31, -48

Tools: (para 9-22-10)

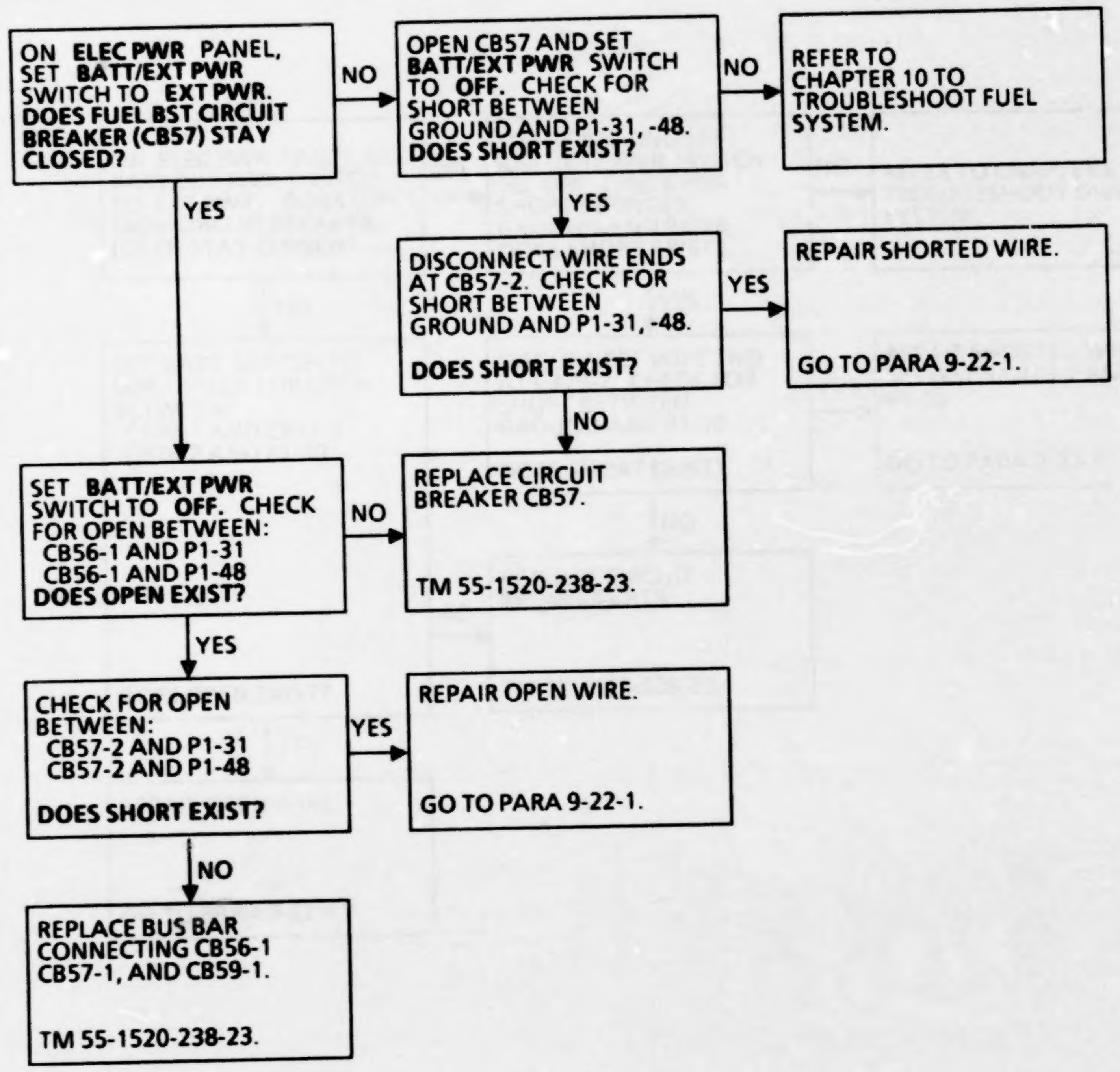
Personnel Required: (para 9-22-10)

References: (para 9-22-11)

Equipment Conditions: (para 9-22-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FUEL BST CIRCUIT BREAKER (CB57) STAY CLOSED?
NO
OPEN CB57 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-31, -48. DOES SHORT EXIST?
NO
REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.
YES
DISCONNECT WIRE ENDS AT CB57-2. CHECK FOR SHORT BETWEEN GROUND AND P1-31, -48. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-22-1.
NO
REPLACE CIRCUIT BREAKER CB57. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB56-1 AND P1-31 CB56-1 AND P1-48 DOES OPEN EXIST?
NO
YES
CHECK FOR OPEN BETWEEN: CB57-2 AND P1-31 CB57-2 AND P1-48 DOES SHORT EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-22-1.
NO
REPLACE BUS BAR CONNECTING CB56-1 CB57-1, AND CB59-1. TM 55-1520-238-23.

END OF TASK

9-22-13. TWHL LOCK CIRCUIT BREAKER (CB59) - DOES NOT STAY CLOSED OR 28 VDC TO TAIL WHEEL LOCK PANEL IS NOT PRESENT AT P1-15

Tools: (para 9-22-10)

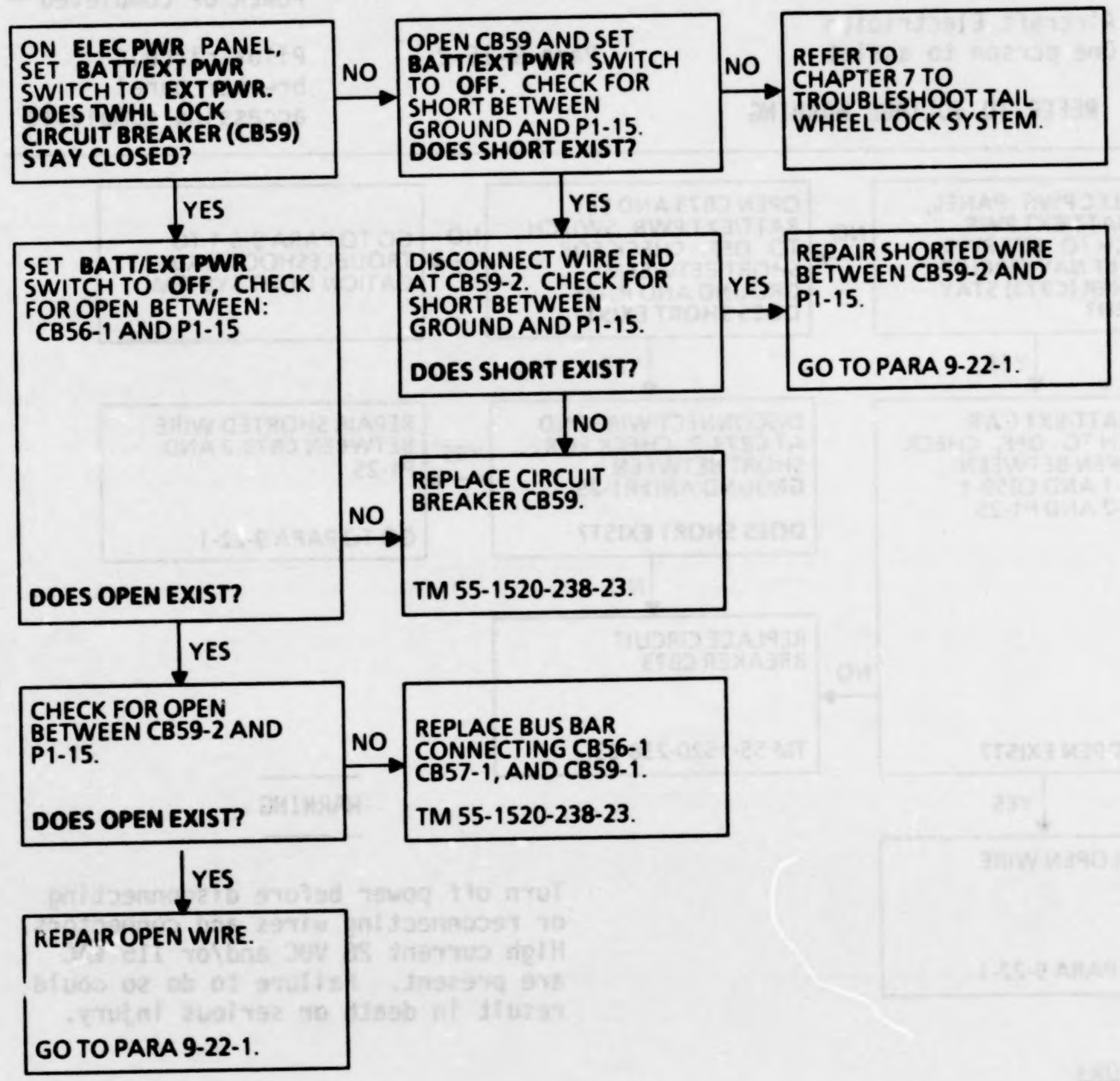
Personnel Required: (para 9-22-10)

References: (para 9-22-11)

Equipment Conditions: (para 9-22-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES TWHL LOCK CIRCUIT BREAKER (CB59) STAY CLOSED?
NO
OPEN CB59 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-15. DOES SHORT EXIST?
NO
REFER TO CHAPTER 7 TO TROUBLESHOOT TAIL WHEEL LOCK SYSTEM.
YES
DISCONNECT WIRE END AT CB59-2. CHECK FOR SHORT BETWEEN GROUND AND P1-15. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB59-2 AND P1-15. GO TO PARA 9-22-1.
NO
REPLACE CIRCUIT BREAKER CB59. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB56-1 AND P1-15 DOES OPEN EXIST?
NO
YES
CHECK FOR OPEN BETWEEN CB59-2 AND P1-15. DOES OPEN EXIST?
NO
REPLACE BUS BAR CONNECTING CB56-1 CB57-1, AND CB59-1. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-22-1.

END OF TASK

9-22-14. LT NAV CIRCUIT BREAKER (CB73) - DOES NOT STAY CLOSED OR 28 VDC TO NAVIGATION LIGHTS IS NOT PRESENT AT P1-25

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

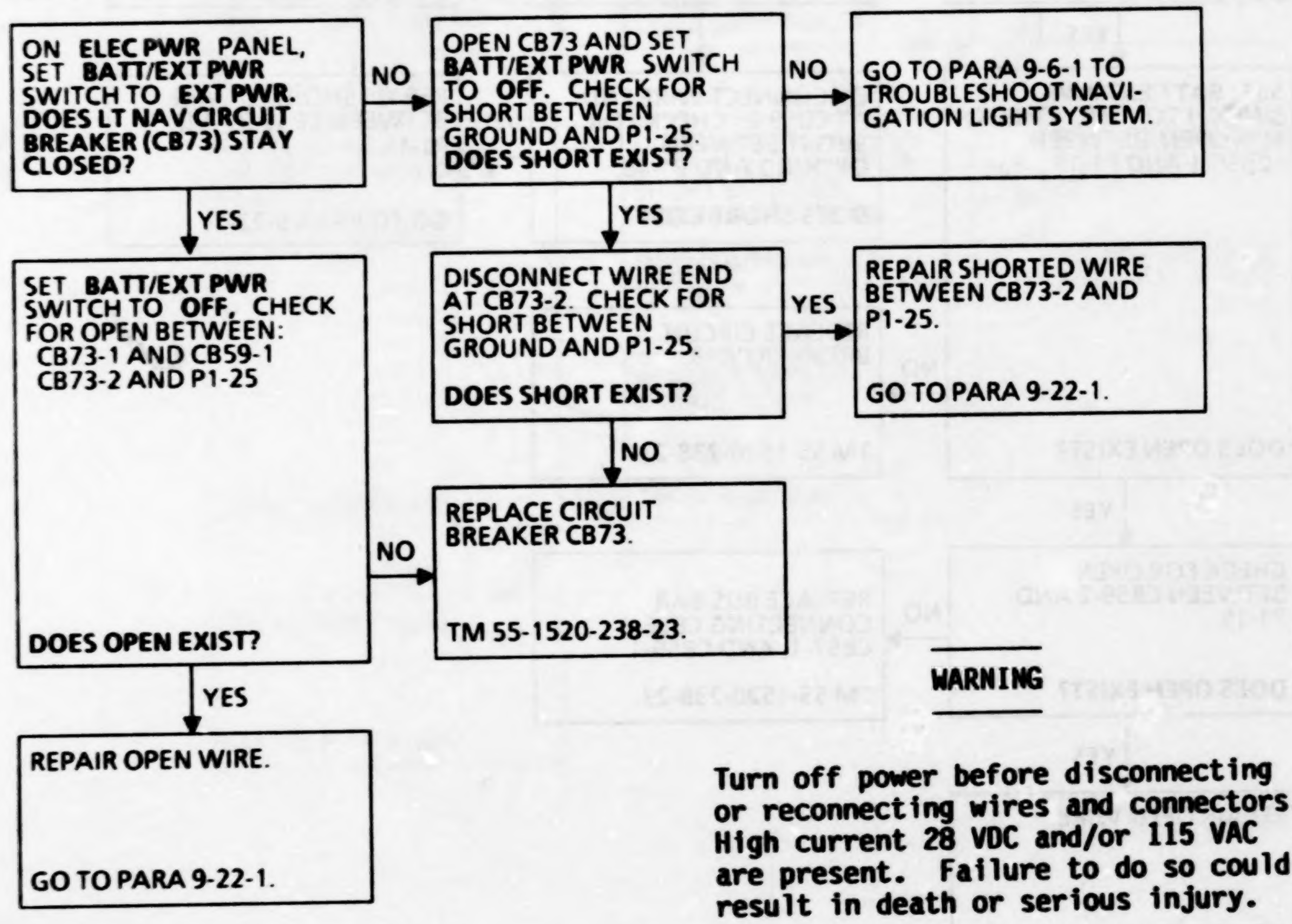
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT NAV CIRCUIT BREAKER (CB73) STAY CLOSED?
NO
OPEN CB73 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-25. DOES SHORT EXIST?
NO
GO TO PARA 9-6-1 TO TROUBLESHOOT NAVIGATION LIGHT SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB73-1 AND CB59-1 CB73-2 AND P1-25
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB73-2. CHECK FOR SHORT BETWEEN GROUND AND P1-25.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB73-2 AND P1-25.
GO TO PARA 9-22-1.
NO
NO
REPLACE CIRCUIT BREAKER CB73.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-22-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-22-15. VIB MON CIRCUIT BREAKER (CB79) - DOES NOT STAY CLOSED OR 28 VDC TO ROTOR BALANCE SIGNAL PROCESSOR IS NOT PRESENT AT P1-10

Tools: (para 9-22-14)

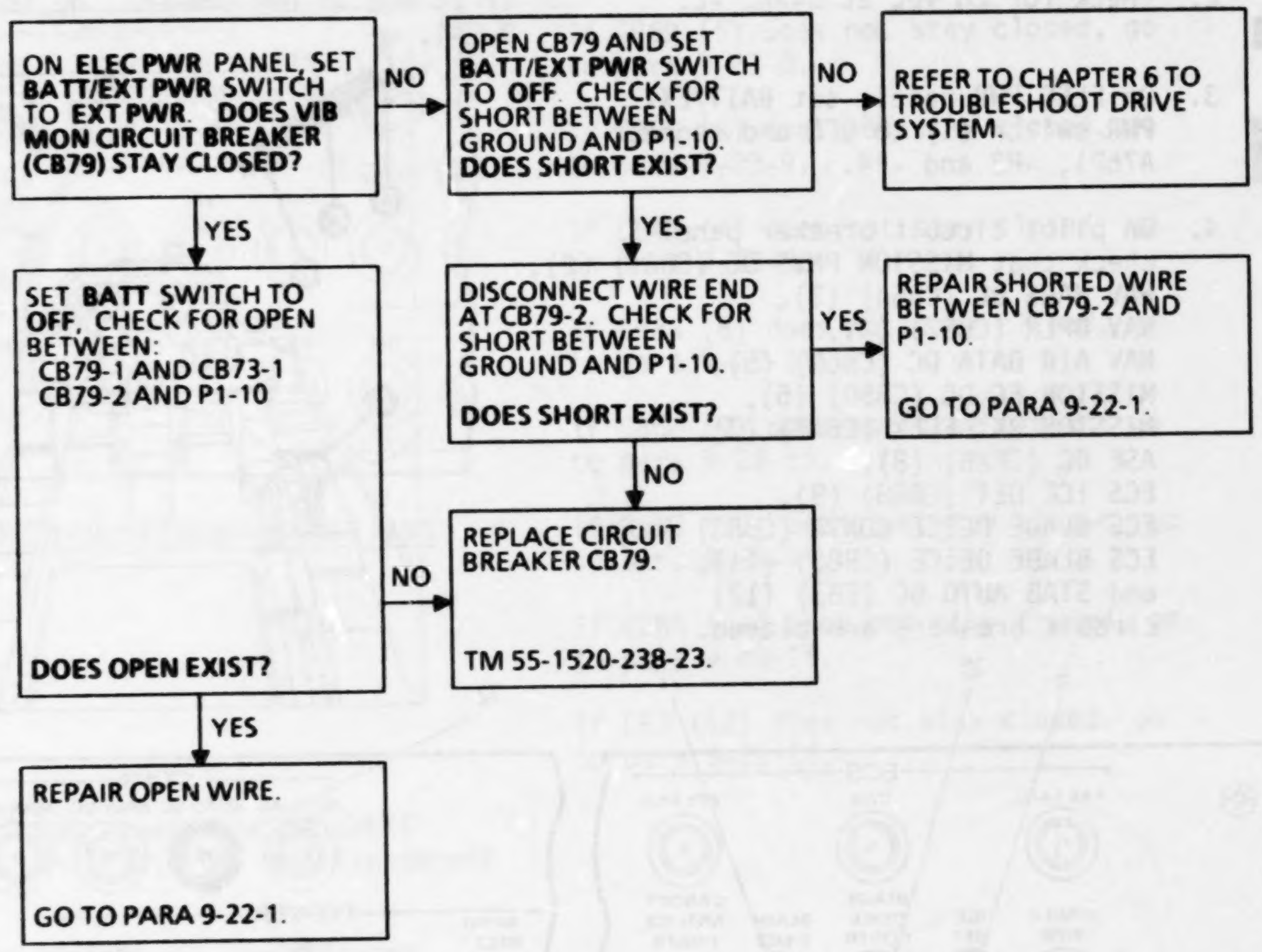
Personnel Required: (para 9-22-14)

References: (para 9-22-14)

Equipment Conditions: (para 9-22-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES VIB MON CIRCUIT BREAKER (CB79) STAY CLOSED?
NO
OPEN CB79 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-10. DOES SHORT EXIST?
NO
REFER TO CHAPTER 6 TO TROUBLESHOOT DRIVE SYSTEM.
YES
YES
SET BATT SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB79-1 AND CB73-1 CB79-2 AND P1-10
DISCONNECT WIRE END AT CB79-2. CHECK FOR SHORT BETWEEN GROUND AND P1-10. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB79-2 AND P1-10. GO TO PARA 9-22-1.
NO
REPLACE CIRCUIT BREAKER CB79. TM 55-1520-238-23.
NO
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-22-1.

END OF TASK

9-23-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

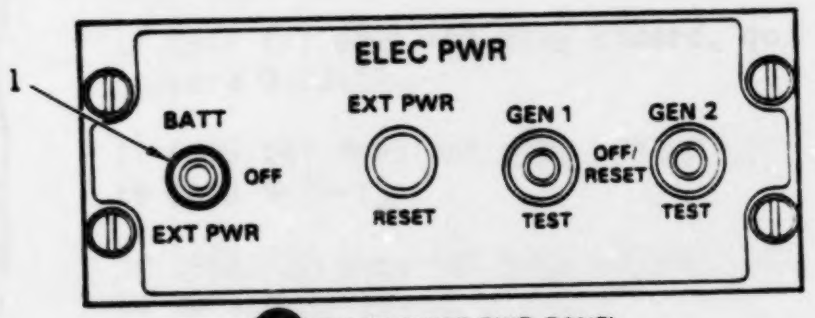
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

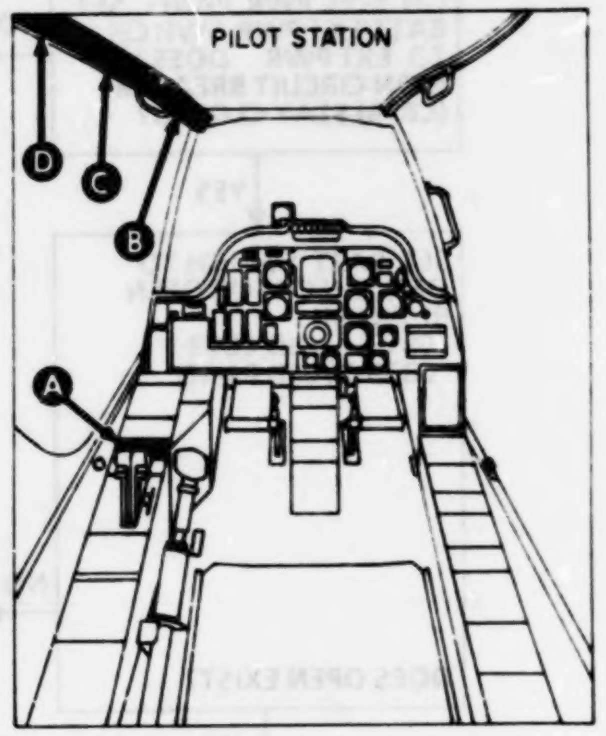
A. Disconnect A76P1, P2 and P4.

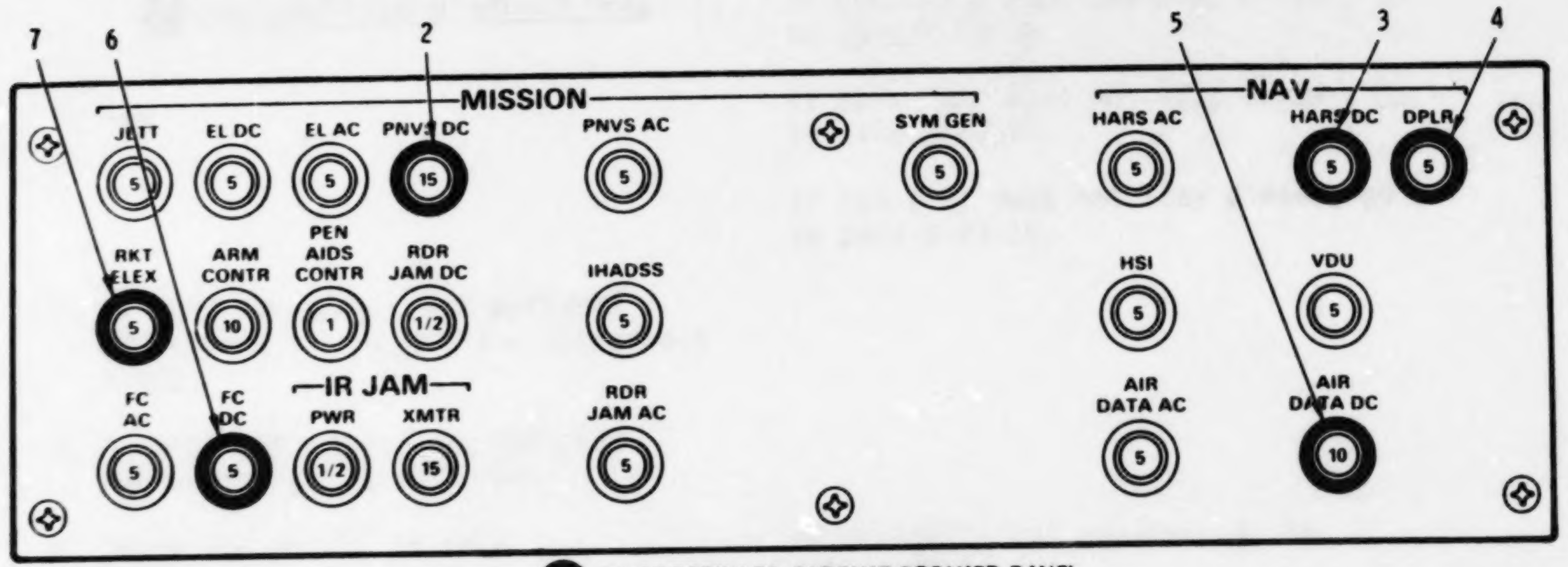
B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P4-K and -L.	If short exists, go to para 9-23-4.
1.1 On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
2. Check for 28 VDC at J4-K, -L.	If 28 VDC is not present, go to para 9-3-1.
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and connect A76P1, -P2 and -P4.	
4. On pilot circuit breaker panel check that **MISSION PNVS DC** (CB61) (2), **NAV HARS DC** (CB54) (3), **NAV DPLR** (CB82) (4), **NAV AIR DATA DC** (CB69) (5), **MISSION FC DC** (CB50) (6), **MISSION RKT ELEX** (CB47) (7), **ASE DC** (CB28) (8), **ECS ICE DET** (CB68) (9), **ECS BLADE DEICE CONTR** (CB83) (10), **ECS BLADE DEICE** (CB85) (11), and **STAB AUTO DC** (CB3) (12) circuit breakers are closed.	

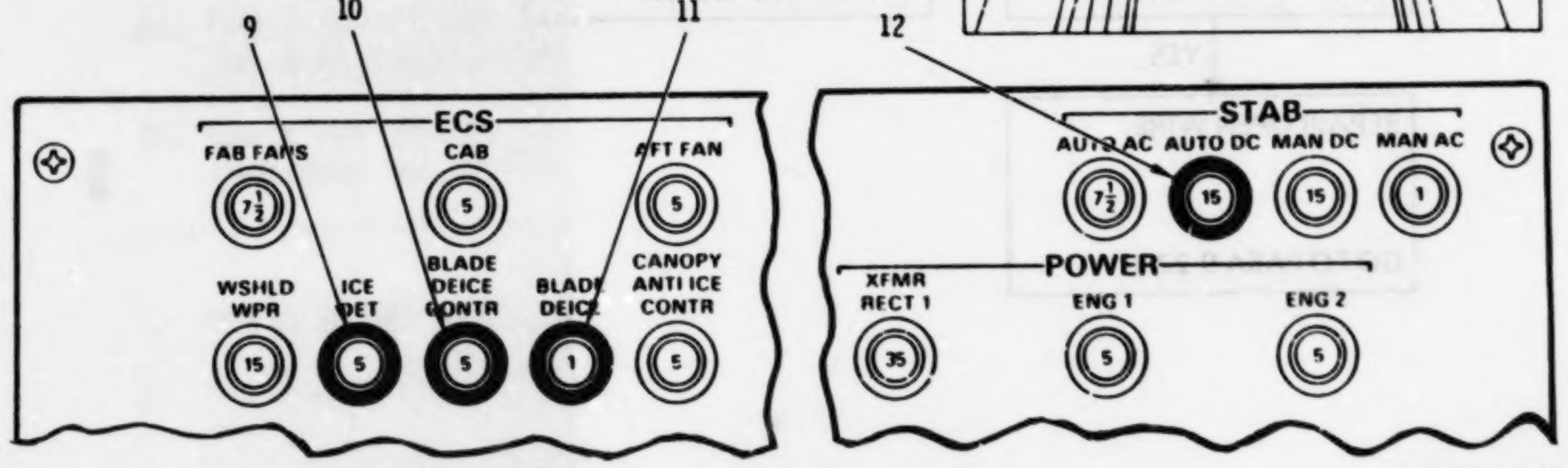

1
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
OFF/RESET
TEST
GEN 2
TEST

A PILOT ELECT PWR PANEL


PILOT STATION
D
C
B
A


7
6
2
5
3
4
MISSION
NAV
JETT
EL DC
EL AC
PNVS DC
PNVS AC
SYM GEN
HARS AC
HARS DC
DPLR
RKT ELEX
ARM CONTR
PEN AIDS CONTR
RDR JAM DC
IHADSS
HSI
VDU
FC AC
FC DC
IR JAM
PWR
XMTR
RDR JAM AC
AIR DATA AC
AIR DATA DC
5
5
5
15
5
5
5
5
5
5
10
1
1/2
5
5
5
5
5
1/2
15
5
5
10

B PILOT FORWARD CIRCUIT BREAKER PANEL


9
10
11
12
ECS
FAB FANS
CAB
AFT FAN
WSHLD WPR
ICE DET
BLADE DEICE CONTR
BLADE DEICE
CANOPY ANTI ICE CONTR
STAB
AUTO AC
AUTO DC
MAN DC
MAN AC
XFMR RECT 1
POWER
ENG 1
ENG 2
7½
5
5
15
5
5
1
5
7½
15
15
1
35
5
5

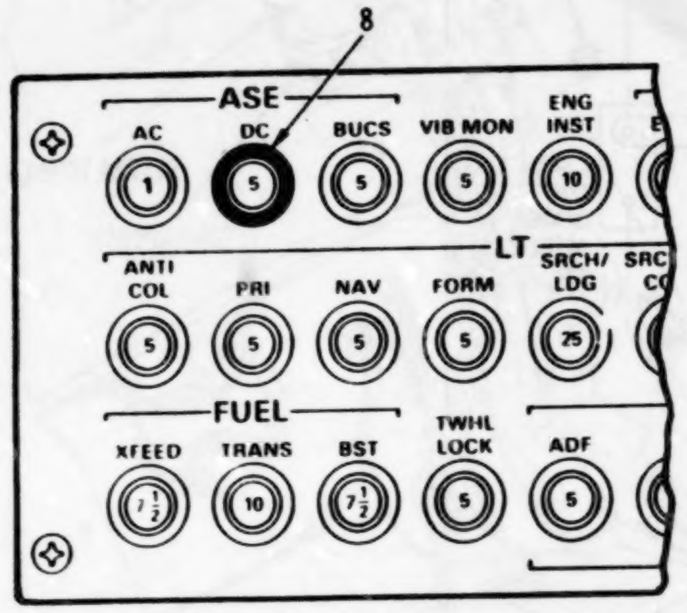
D PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1013A

GO TO NEXT PAGE

9-23-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - OPERATIONAL CHECK (cont)

TASK	RESULT
5. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
6. Check that circuit breakers listed in step 4 remain closed.	If CB61 (2) does not stay closed, go to para 9-23-5.
	If CB54 (3) does not stay closed, go to para 9-23-6.
	If CB82 (4) does not stay closed, go to para 9-23-7.
	If CB69 (5) does not stay closed, go to para 9-23-8.
	If CB50 (6) does not stay closed, go to para 9-23-9.
	If CB47 (7) does not stay closed, go to para 9-23-10.
	If CB28 (8) does not stay closed, go to para 9-23-11.
	If CB68 (9) does not stay closed, go to para 9-23-13.
	If CB83 (10) does not stay closed, go to para 9-23-14.
	If CB85 (11) does not stay closed, go to para 9-23-15.
	If CB3 (12) does not stay closed, go to para 9-23-16.
7. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and disconnect A76P2.	
8. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
9. Check for 28 VDC to PNVS electronic unit at P2-k.	If 28 VDC is not present, go to para 9-23-5.



Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL

TASK	RESULT
10. Check for 28 VDC to air data processor at P2-J.	If 28 VDC is not present, go to para 9-23-8.
11. Check for 28 VDC to stabilator control unit at P2-f.	If 28 VDC is not present, go to para 9-23-16.
12. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and connect A76P2.	
13. Disconnect A76P1, on **ELEC PWR** panel, set **BATT EXT PWR** switch (1) to **EXT PWR.**	
14. Check for 28 VDC to HARS at P1-46.	If 28 VDC is not present, go to para 9-23-6.
15. Check for 28 VDC to doppler signal data at P1-51.	If 28 VDC is not present, go to para 9-23-7.
16. Check for 28 VDC to pilot **FIRE CONTROL** panel at P1-17.	If 28 VDC is not present, go to para 9-23-9.
17. Check for 28 VDC to CPG **FIRE CONTROL** panel at P1-27.	If 28 VDC is not present, go to para 9-23-10.
18. Check for 28 VDC to ASE panel at P1-34.	If 28 VDC is not present, go to para 9-23-11.
19. Check for 28 VDC to ice detector signal processor at P1-47.	If 28 VDC is not present, go to para 9-23-13.
20. Check for 28 VDC to rotor blade deice controller at P1-14.	If 28 VDC is not present, go to para 9-23-14.
21. Check for 28 VDC to blade deice contactor at P1-53.	If 28 VDC is not present, go to para 9-23-15.

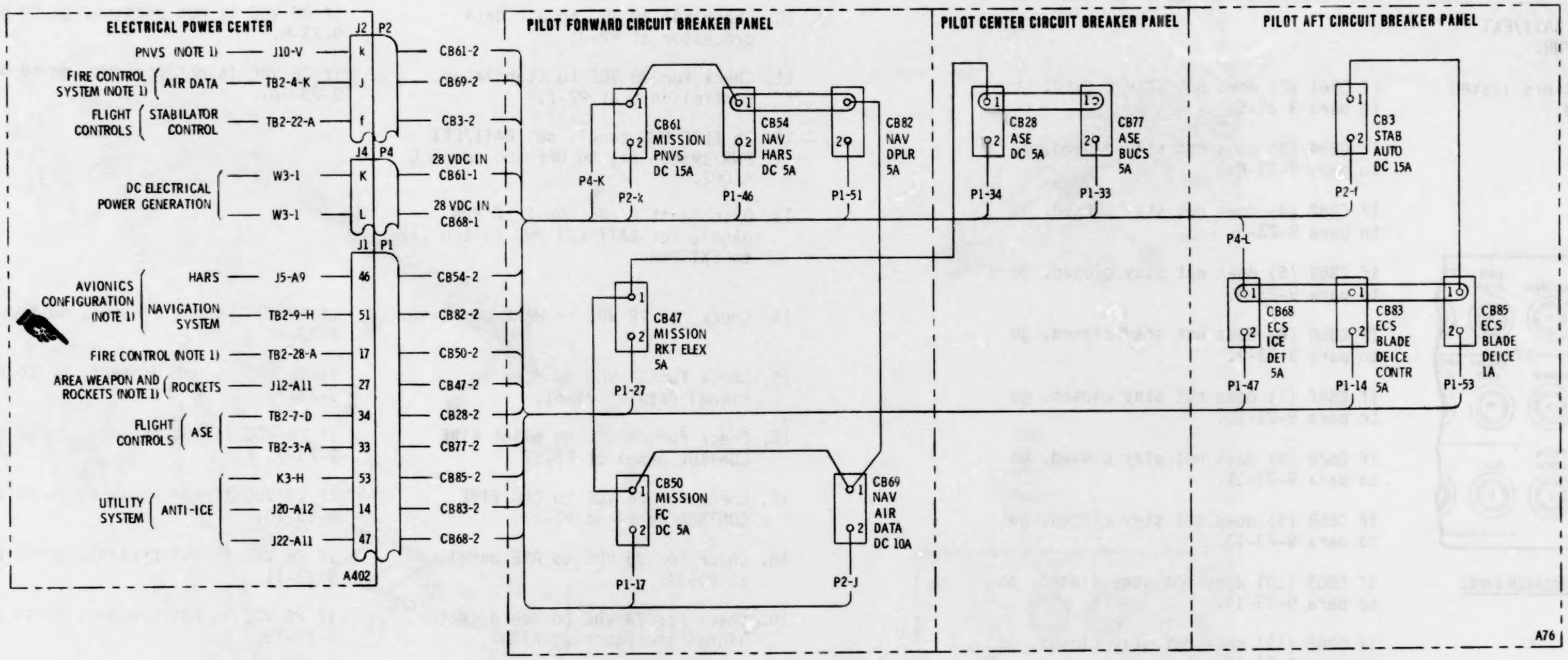
C. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF.**

D. Reconnect A76P1.

E. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-23-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - PILOT STATION) - INTERCONNECTION DIAGRAM

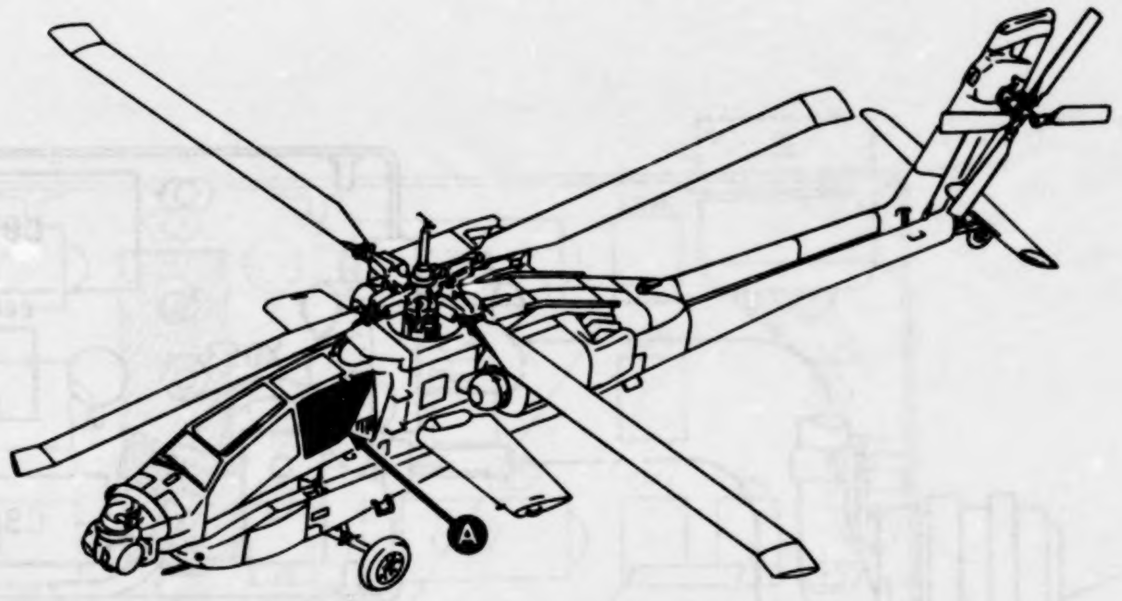

ELECTRICAL POWER CENTER
PNVS (NOTE 1)
J10-V
FIRE CONTROL SYSTEM (NOTE 1)
AIR DATA
TB2-4-K
FLIGHT CONTROLS
STABILATOR CONTROL
TB2-22-A
DC ELECTRICAL POWER GENERATION
W3-1
W3-1
AVIONICS CONFIGURATION (NOTE 1)
HARS
J5-A9
NAVIGATION SYSTEM
TB2-9-H
FIRE CONTROL (NOTE 1)
TB2-28-A
AREA WEAPON AND ROCKETS (NOTE 1)
ROCKETS
J12-A11
FLIGHT CONTROLS
ASE
TB2-7-D
TB2-3-A
UTILITY SYSTEM
ANTI-ICE
K3-H
J20-A12
J22-A11
J2 P2
k
J
f
J4 P4
K
L
J1 P1
46
51
17
27
34
33
53
14
47
A402
CB61-2
CB69-2
CB3-2
28 VDC IN
CB61-1
28 VDC IN
CB68-1
CB54-2
CB82-2
CB50-2
CB47-2
CB28-2
CB77-2
CB85-2
CB83-2
CB68-2
PILOT FORWARD CIRCUIT BREAKER PANEL
CB61 MISSION PNVS DC 15A
CB54 NAV HARS DC 5A
CB82 NAV DPLR 5A
P4-K
P2-k
P1-46
P1-51
CB47 MISSION RKT ELEX 5A
P1-27
CB50 MISSION FC DC 5A
P1-17
CB69 NAV AIR DATA DC 10A
P2-J
PILOT CENTER CIRCUIT BREAKER PANEL
CB28 ASE DC 5A
CB77 ASE BUCS 5A
P1-34
P1-33
PILOT AFT CIRCUIT BREAKER PANEL
CB3 STAB AUTO DC 15A
P2-f
P4-L
CB68 ECS ICE DET 5A
CB83 ECS BLADE DEICE CONTR 5A
CB85 ECS BLADE DEICE 1A
P1-47
P1-14
P1-53
A76

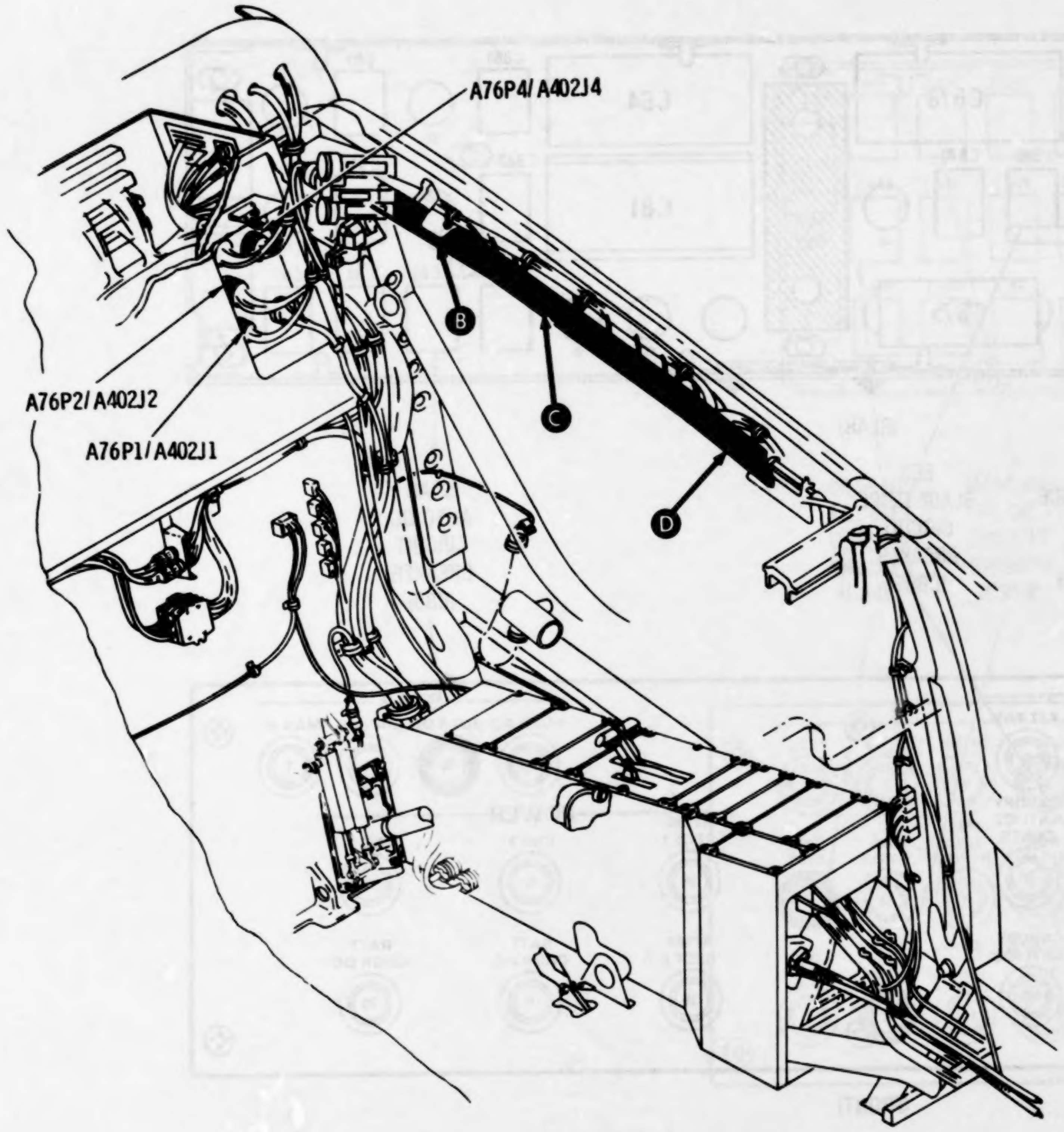
NOTES:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

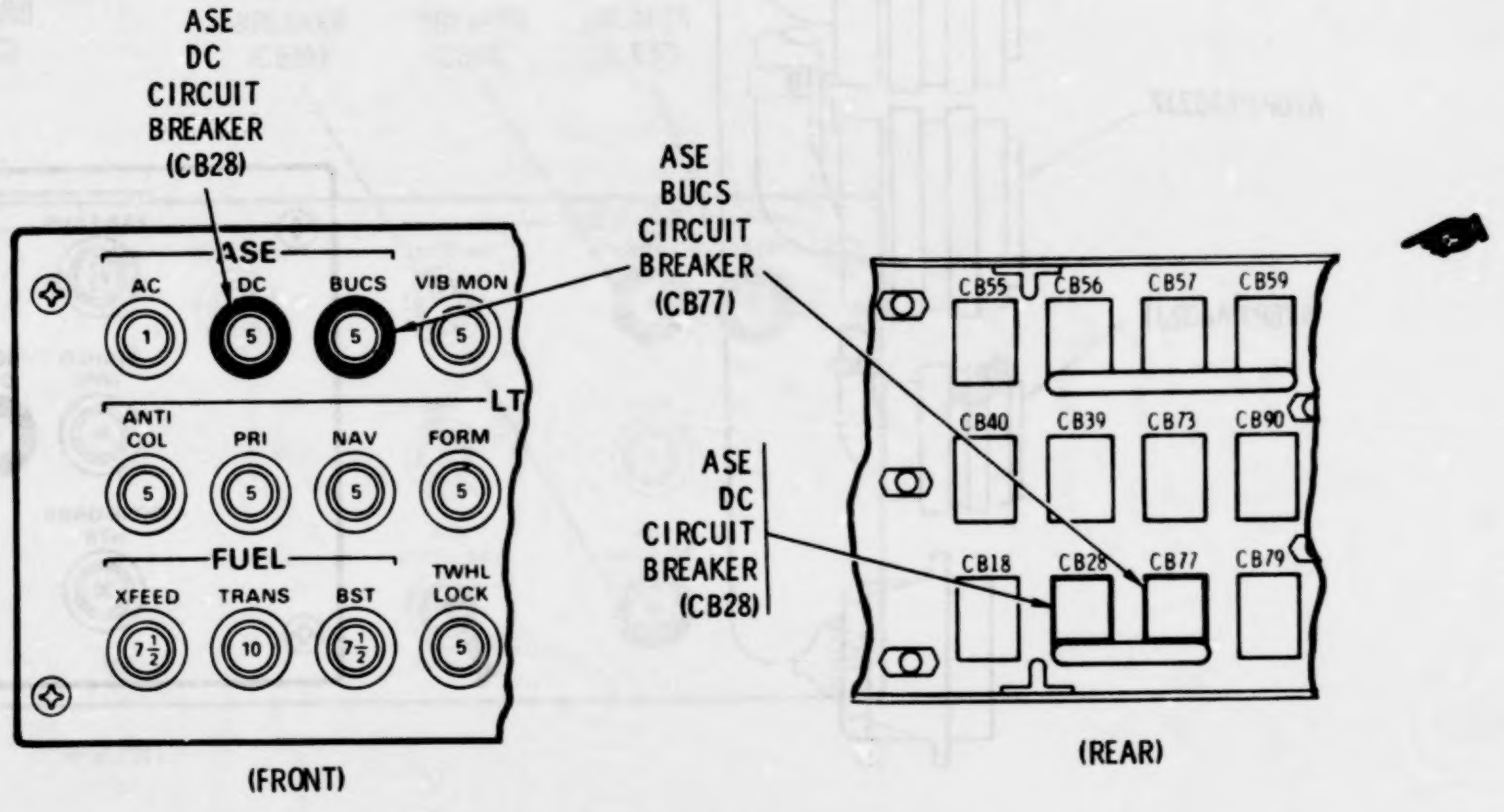
MM04/1-766B

9-23-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION




A76P4/A402J4
B
C
D
A76P2/A402J2
A76P1/A402J1

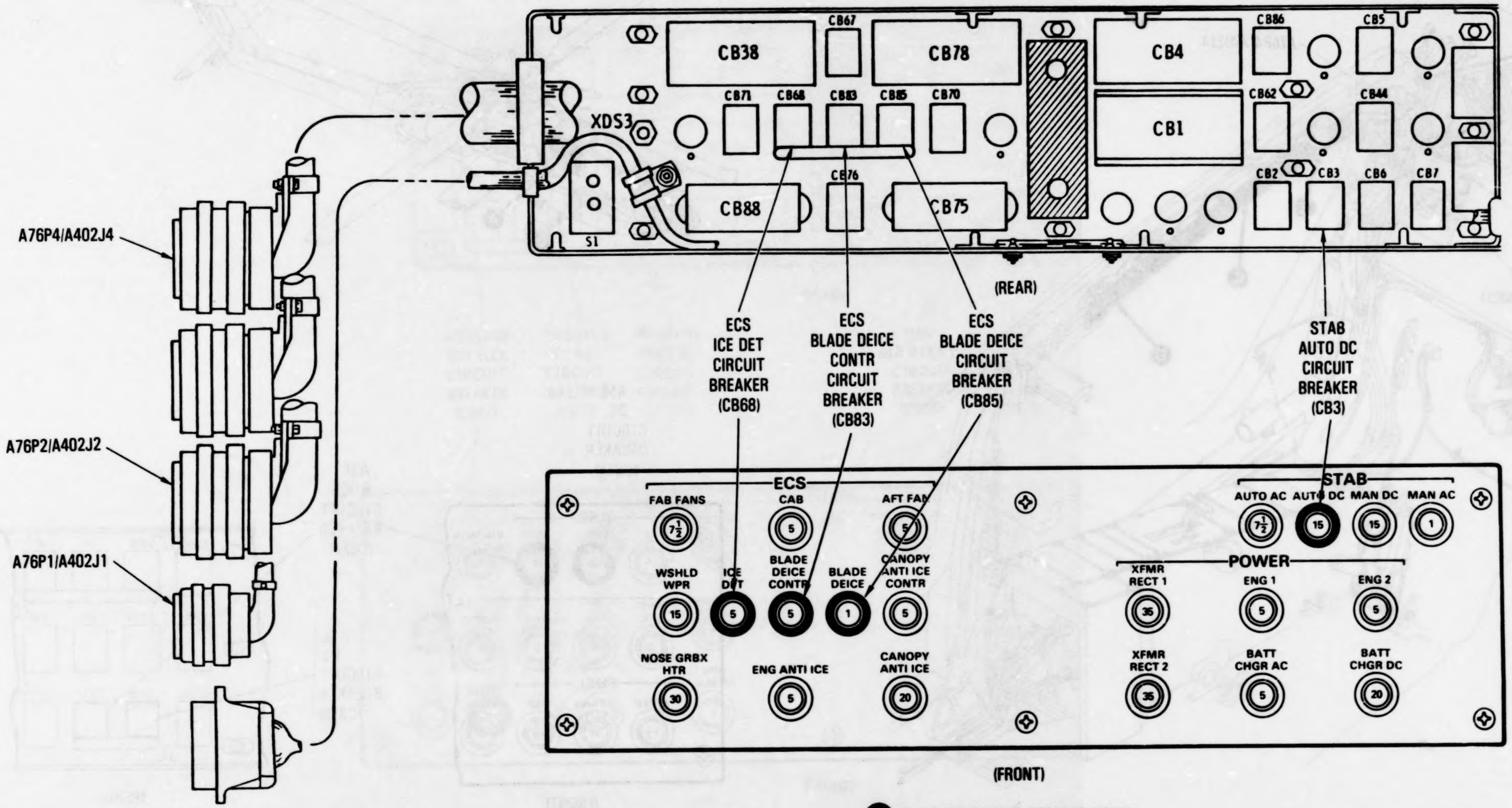
Ⓐ PILOT STATION LEFT CONSOLE


ASE DC CIRCUIT BREAKER (CB28)
ASE BUCS CIRCUIT BREAKER (CB77)
ASE
AC
1
DC
5
BUCS
5
VIB MON
5
LT
ANTI COL
5
PRI
5
NAV
5
FORM
5
FUEL
XFEED
7½
TRANS
10
BST
7½
TWHL LOCK
5
(FRONT)
CB55
CB56
CB57
CB59
CB40
CB39
CB73
CB90
CB18
CB28
CB77
CB79
ASE DC CIRCUIT BREAKER (CB28)
(REAR)

Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1144-1B

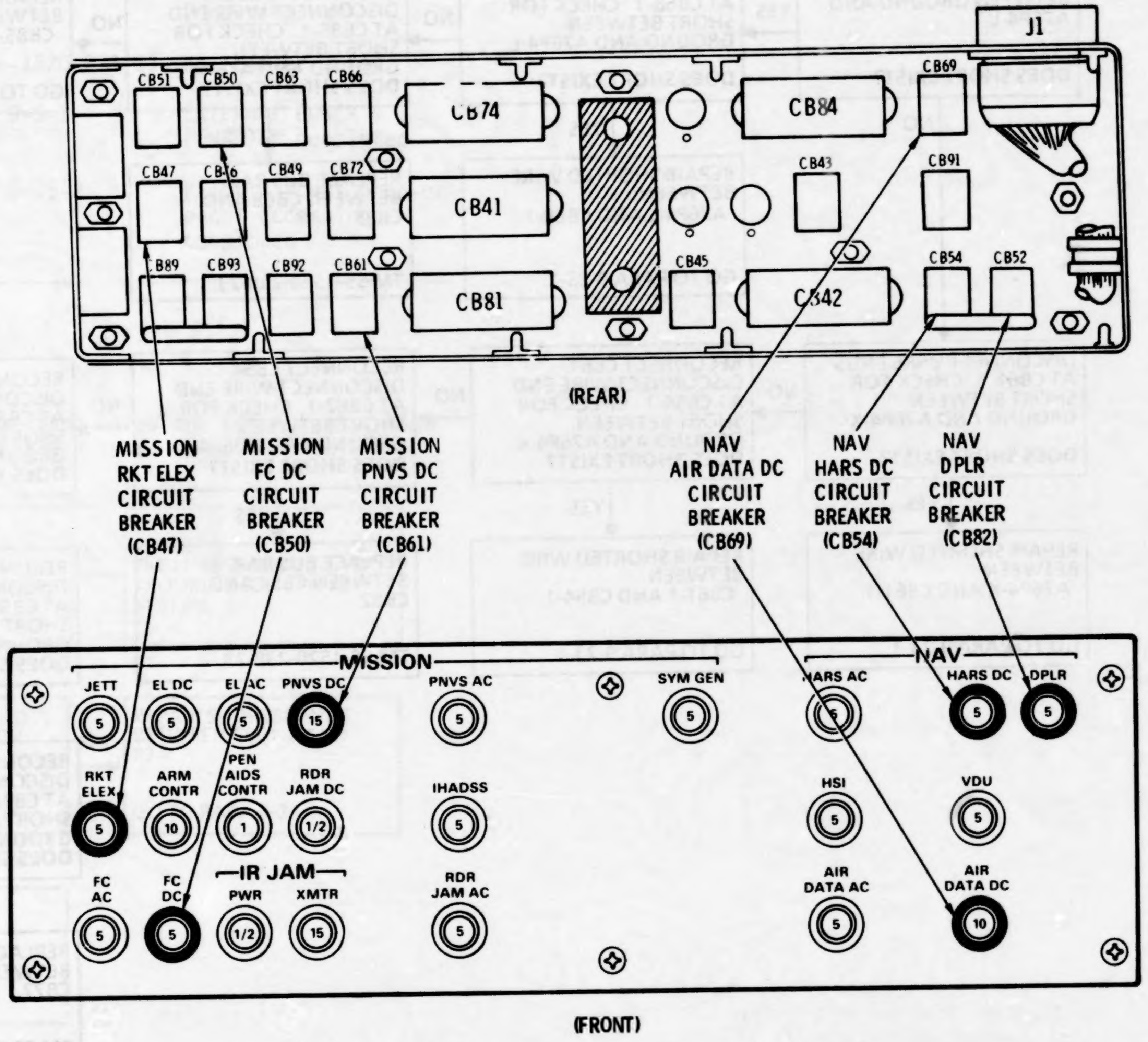
9-23-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


CB38
CB67
CB78
CB4
CB86
CB5
CB71
CB68
CB83
CB85
CB70
CB1
CB62
CB44
XDS3
CB76
CB88
CB75
CB2
CB3
CB6
CB7
S1
A76P4/A402J4
A76P2/A402J2
A76P1/A402J1
(REAR)
ECS ICE DET CIRCUIT BREAKER (CB68)
ECS BLADE DEICE CONTR CIRCUIT BREAKER (CB83)
ECS BLADE DEICE CIRCUIT BREAKER (CB85)
STAB AUTO DC CIRCUIT BREAKER (CB3)
ECS
FAB FANS
CAB
AFT FAN
WSHLD WPR
ICE DET
BLADE DEICE CONTR
BLADE DEICE
CANOPY ANTI ICE CONTR
NOSE GRBX HTR
ENG ANTI ICE
CANOPY ANTI ICE
STAB
AUTO AC
AUTO DC
MAN DC
MAN AC
POWER
XFMR RECT 1
ENG 1
ENG 2
XFMR RECT 2
BATT CHGR AC
BATT CHGR DC
7½
5
5
15
5
5
1
5
30
5
20
7½
15
15
1
35
5
5
35
5
20
(FRONT)

Ⓑ PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1144-2A

9-23-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


J1
CB51
CB50
CB63
CB66
CB74
CB84
CB69
CB47
CB46
CB49
CB72
CB41
CB43
CB91
CB89
CB93
CB92
CB61
CB81
CB45
CB42
CB54
CB52
(REAR)
MISSION RKT ELEX CIRCUIT BREAKER (CB47)
MISSION FC DC CIRCUIT BREAKER (CB50)
MISSION PNVS DC CIRCUIT BREAKER (CB61)
NAV AIR DATA DC CIRCUIT BREAKER (CB69)
NAV HARS DC CIRCUIT BREAKER (CB54)
NAV DPLR CIRCUIT BREAKER (CB82)
MISSION
NAV
JETT
EL DC
EL AC
PNVS DC
PNVS AC
SYM GEN
HARS AC
HARS DC
DPLR
RKT ELEX
ARM CONTR
PEN AIDS CONTR
RDR JAM DC
IHADSS
HSI
VDU
FC AC
FC DC
IR JAM
PWR
XMTR
RDR JAM AC
AIR DATA AC
AIR DATA DC
5
10
15
1
1/2
(FRONT)

Ⓓ PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-1144-3A

9-23-4. A SHORT EXISTS BETWEEN GROUND AND A76P4-L OR -K

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

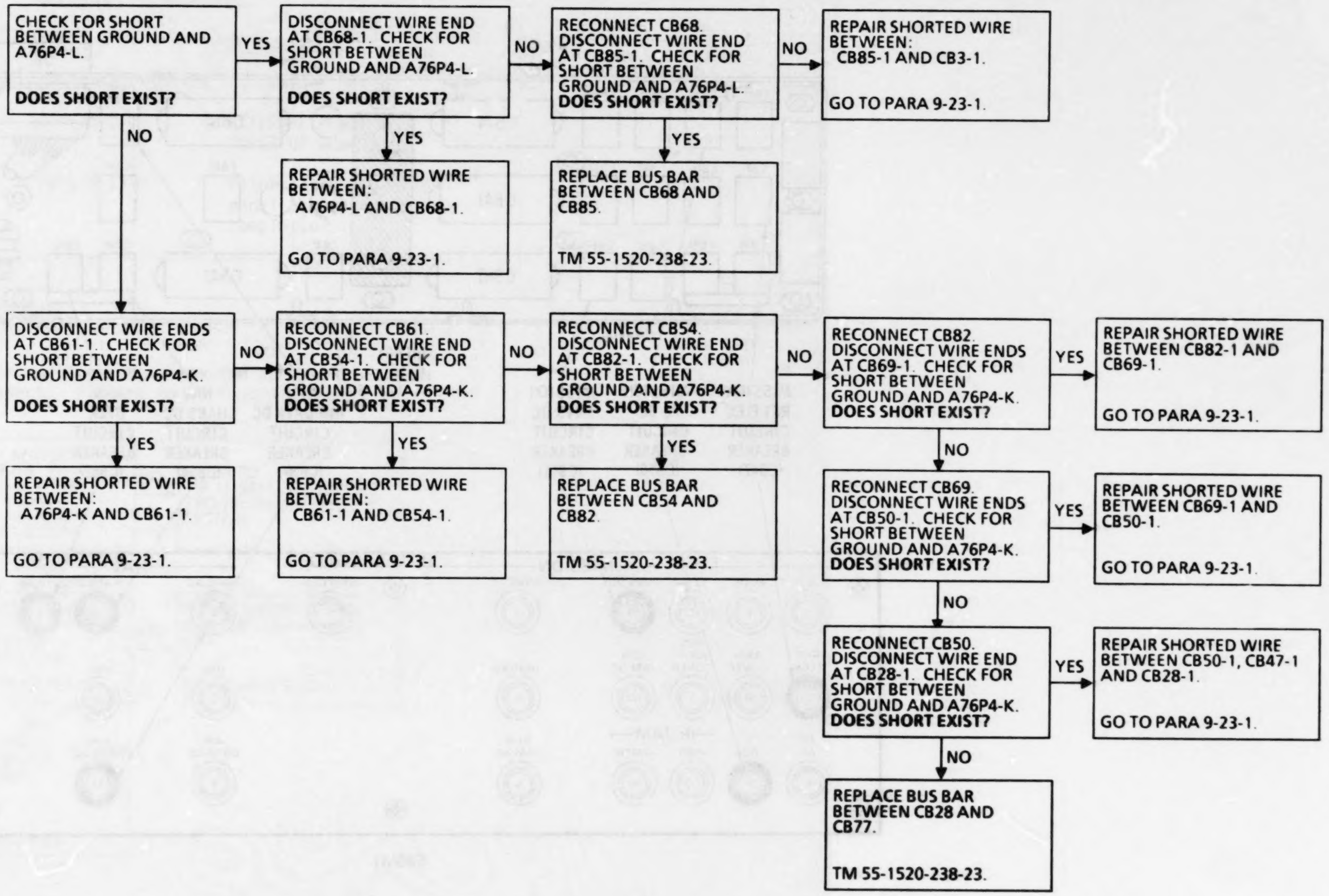
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-23-1	All DC essential bus 3 - pilot station circuit breakers open


CHECK FOR SHORT BETWEEN GROUND AND A76P4-L. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB68-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-L. DOES SHORT EXIST?
NO
RECONNECT CB68. DISCONNECT WIRE END AT CB85-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-L. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN: CB85-1 AND CB3-1. GO TO PARA 9-23-1.
YES
REPAIR SHORTED WIRE BETWEEN: A76P4-L AND CB68-1. GO TO PARA 9-23-1.
YES
REPLACE BUS BAR BETWEEN CB68 AND CB85. TM 55-1520-238-23.
NO
DISCONNECT WIRE ENDS AT CB61-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
NO
RECONNECT CB61. DISCONNECT WIRE END AT CB54-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
NO
RECONNECT CB54. DISCONNECT WIRE END AT CB82-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
NO
RECONNECT CB82. DISCONNECT WIRE ENDS AT CB69-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB82-1 AND CB69-1. GO TO PARA 9-23-1.
YES
REPAIR SHORTED WIRE BETWEEN: A76P4-K AND CB61-1. GO TO PARA 9-23-1.
YES
REPAIR SHORTED WIRE BETWEEN: CB61-1 AND CB54-1. GO TO PARA 9-23-1.
YES
REPLACE BUS BAR BETWEEN CB54 AND CB82. TM 55-1520-238-23.
NO
RECONNECT CB69. DISCONNECT WIRE ENDS AT CB50-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB69-1 AND CB50-1. GO TO PARA 9-23-1.
NO
RECONNECT CB50. DISCONNECT WIRE END AT CB28-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB50-1, CB47-1 AND CB28-1. GO TO PARA 9-23-1.
NO
REPLACE BUS BAR BETWEEN CB28 AND CB77. TM 55-1520-238-23.

END OF TASK

9-23-5. MISSION PNVS DC CIRCUIT BREAKER (CB61) - DOES NOT STAY CLOSED OR 28 VDC TO PNVS ELECTRONIC UNIT IS NOT PRESENT AT P2-k

Tools: (para 9-23-4)

Personnel Required: (para 9-23-4)

References:

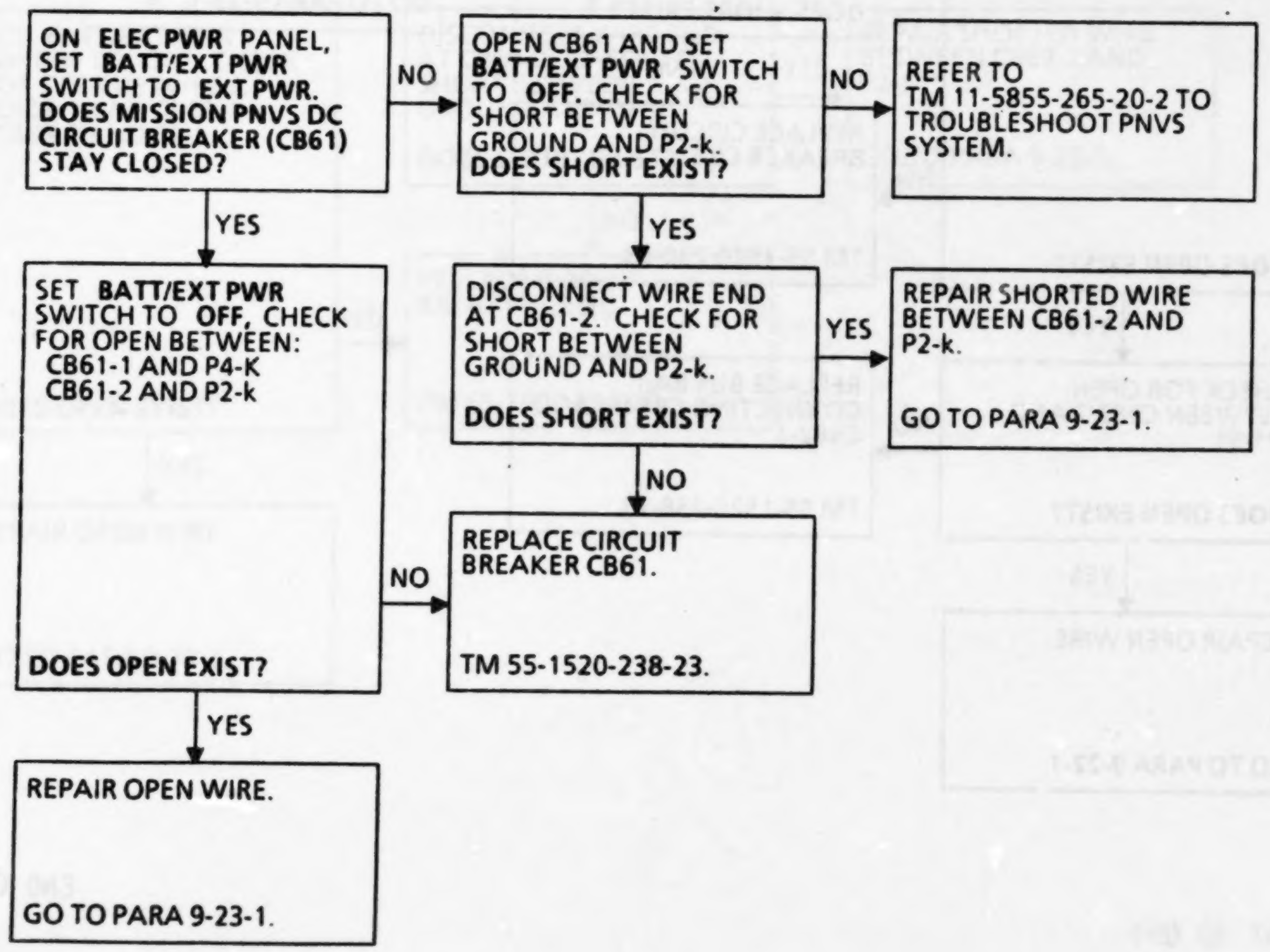
TM 55-1520-238-23
TM 11-5855-265-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION PNVS DC CIRCUIT BREAKER (CB61) STAY CLOSED?
NO
OPEN CB61 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-k. DOES SHORT EXIST?
NO
REFER TO TM 11-5855-265-20-2 TO TROUBLESHOOT PNVS SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB61-1 AND P4-K CB61-2 AND P2-k
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB61-2. CHECK FOR SHORT BETWEEN GROUND AND P2-k.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB61-2 AND P2-k.
GO TO PARA 9-23-1.
NO
NO
REPLACE CIRCUIT BREAKER CB61.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

END OF TASK

9-23-6. NAV HARS DC CIRCUIT BREAKER (CB54) - DOES NOT STAY CLOSED OR 28 VDC TO HARS IS NOT PRESENT AT P1-46

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

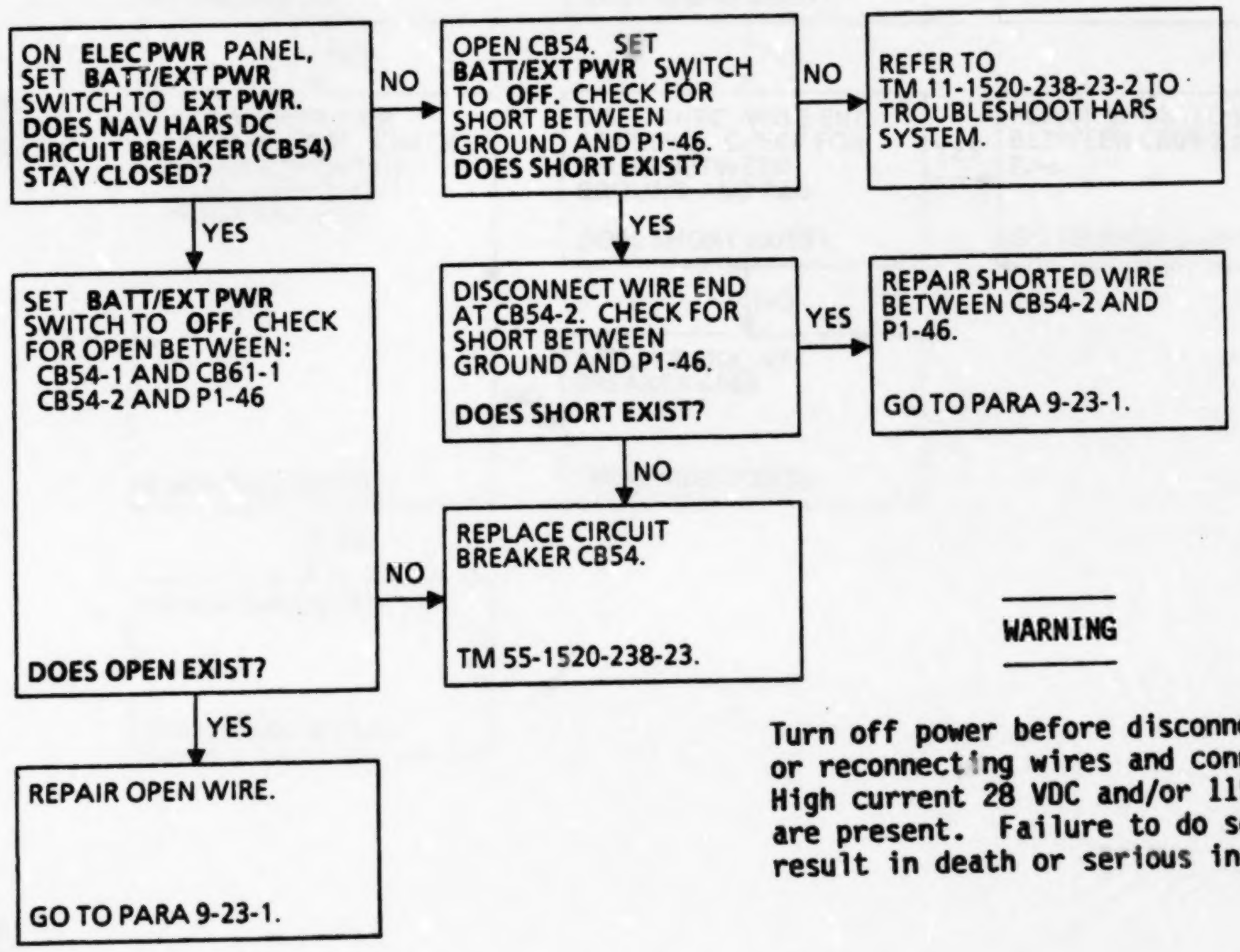
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV HARS DC CIRCUIT BREAKER (CB54) STAY CLOSED?
NO
OPEN CB54. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-46. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT HARS SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB54-1 AND CB61-1 CB54-2 AND P1-46
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB54-2. CHECK FOR SHORT BETWEEN GROUND AND P1-46.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB54-2 AND P1-46.
GO TO PARA 9-23-1.
NO
NO
REPLACE CIRCUIT BREAKER CB54.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-23-7. NAV DPLR CIRCUIT BREAKER (CB82) - DOES NOT STAY CLOSED OR 28 VDC TO DOPPLER SIGNAL DATA COMPARATOR IS NOT PRESENT AT P1-51

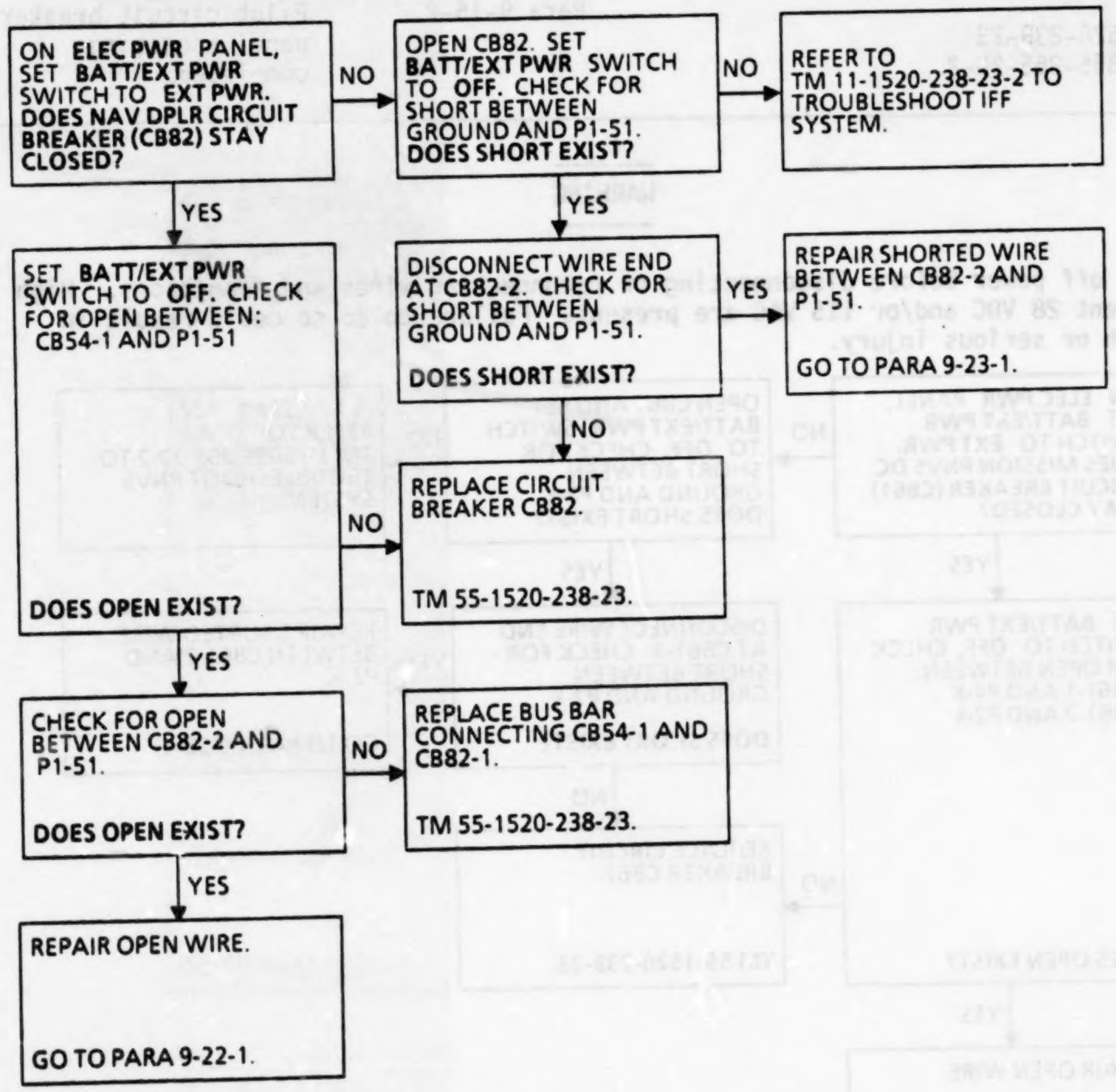
Tools: (para 9-23-6)

Personnel Required: (para 9-23-6)

References: (para 9-23-6)

Equipment Conditions: (para 9-23-6)

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV DPLR CIRCUIT BREAKER (CB82) STAY CLOSED?
NO
OPEN CB82. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-51. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT IFF SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB54-1 AND P1-51
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB82-2. CHECK FOR SHORT BETWEEN GROUND AND P1-51.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB82-2 AND P1-51.
GO TO PARA 9-23-1.
NO
NO
REPLACE CIRCUIT BREAKER CB82.
TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN CB82-2 AND P1-51.
DOES OPEN EXIST?
NO
REPLACE BUS BAR CONNECTING CB54-1 AND CB82-1.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-22-1.

END OF TASK

9-23-8. NAV AIR DATA DC CIRCUIT BREAKER (CB69) - DOES NOT STAY CLOSED OR 28 VDC TO AIR DATA PROCESSOR IS NOT PRESENT AT P2-J

Tools: (para 9-23-6)

Personnel Required: (para 9-23-6)

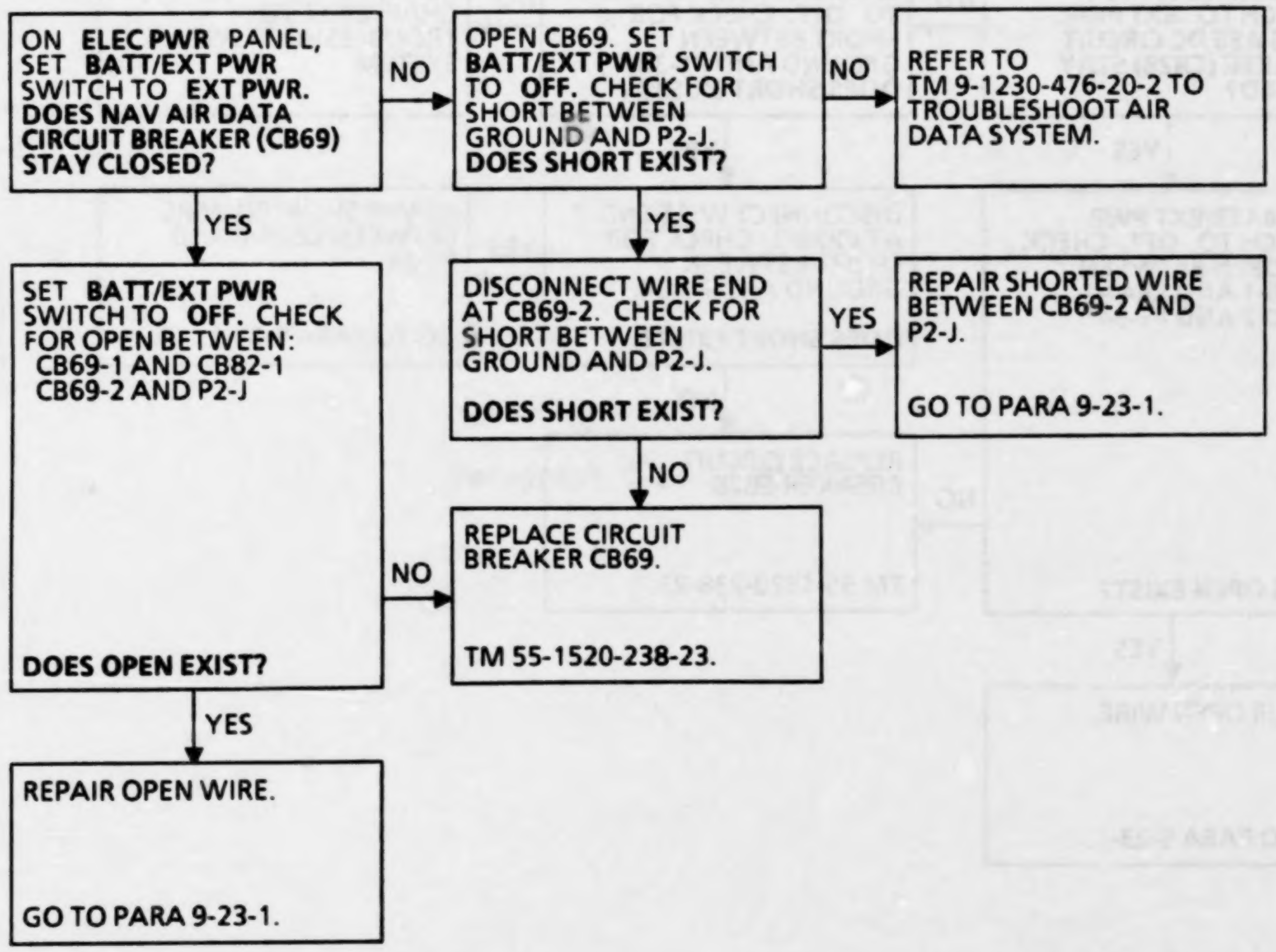
References:

TM 9-1230-476-20-2
TM 55-1520-238-23

Equipment Conditions: (para 9-23-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV AIR DATA CIRCUIT BREAKER (CB69) STAY CLOSED?
NO
OPEN CB69. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-J. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT AIR DATA SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB69-1 AND CB82-1 CB69-2 AND P2-J
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB69-2. CHECK FOR SHORT BETWEEN GROUND AND P2-J.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB69-2 AND P2-J.
GO TO PARA 9-23-1.
NO
REPLACE CIRCUIT BREAKER CB69.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

END OF TASK

9-23-9. MISSION FC DC CIRCUIT BREAKER (CB50) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT FIRE CONTROL PANEL IS NOT PRESENT AT P1-17

Tools: (para 9-23-6)

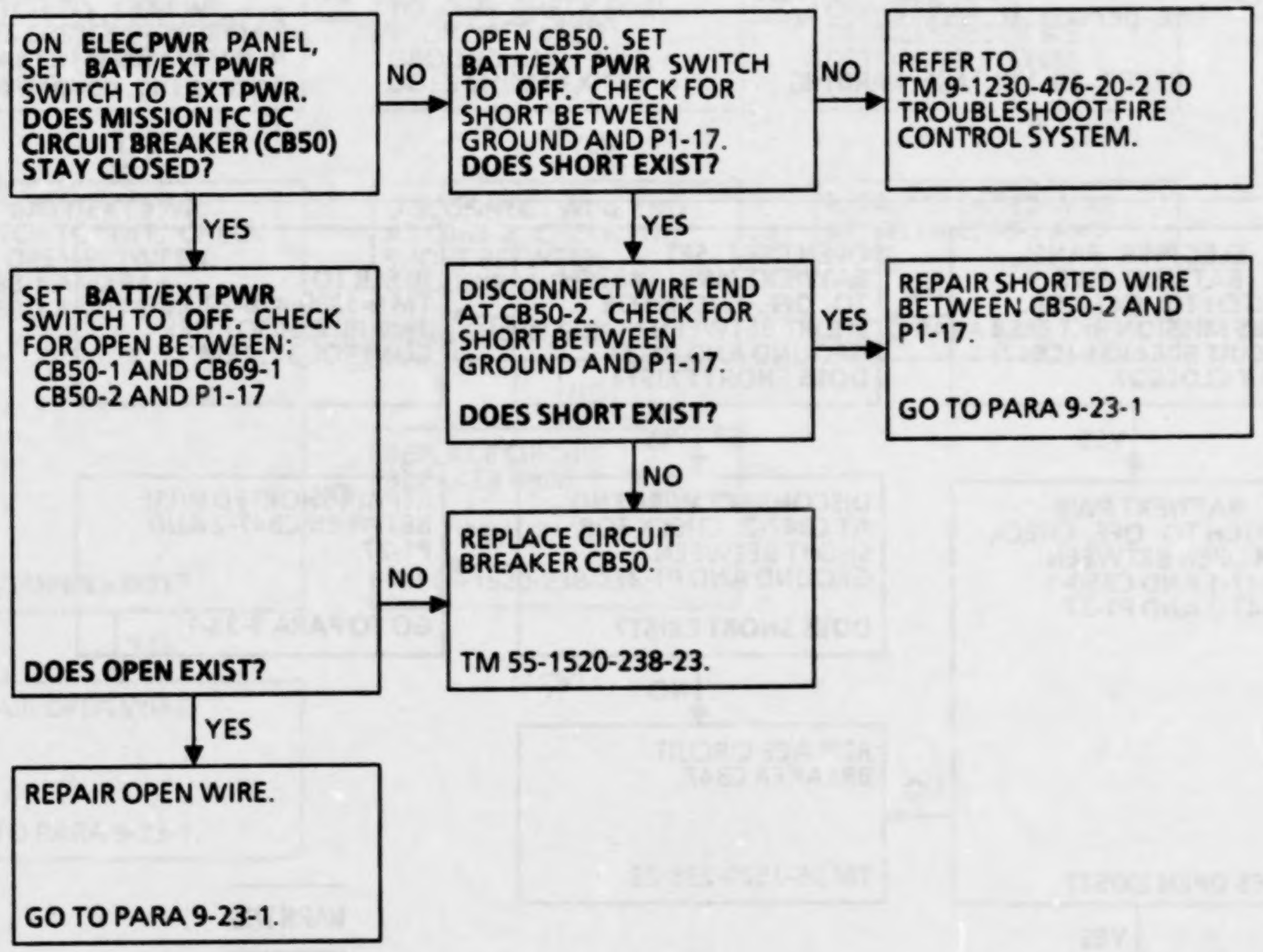
Personnel Required: (para 9-23-6)

References: (para 9-23-8)

Equipment Conditions: (para 9-23-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION FC DC CIRCUIT BREAKER (CB50) STAY CLOSED?
NO
OPEN CB50. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-17. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT FIRE CONTROL SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB50-1 AND CB69-1 CB50-2 AND P1-17
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB50-2. CHECK FOR SHORT BETWEEN GROUND AND P1-17.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB50-2 AND P1-17.
GO TO PARA 9-23-1
NO
REPLACE CIRCUIT BREAKER CB50.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

END OF TASK

9-23-10. MISSION RKT ELEX CIRCUIT BREAKER (CB47) - DOES NOT STAY CLOSED 28 VDC TO CPG FIRE CONTROL PANEL IS NOT PRESENT AT P1-27

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

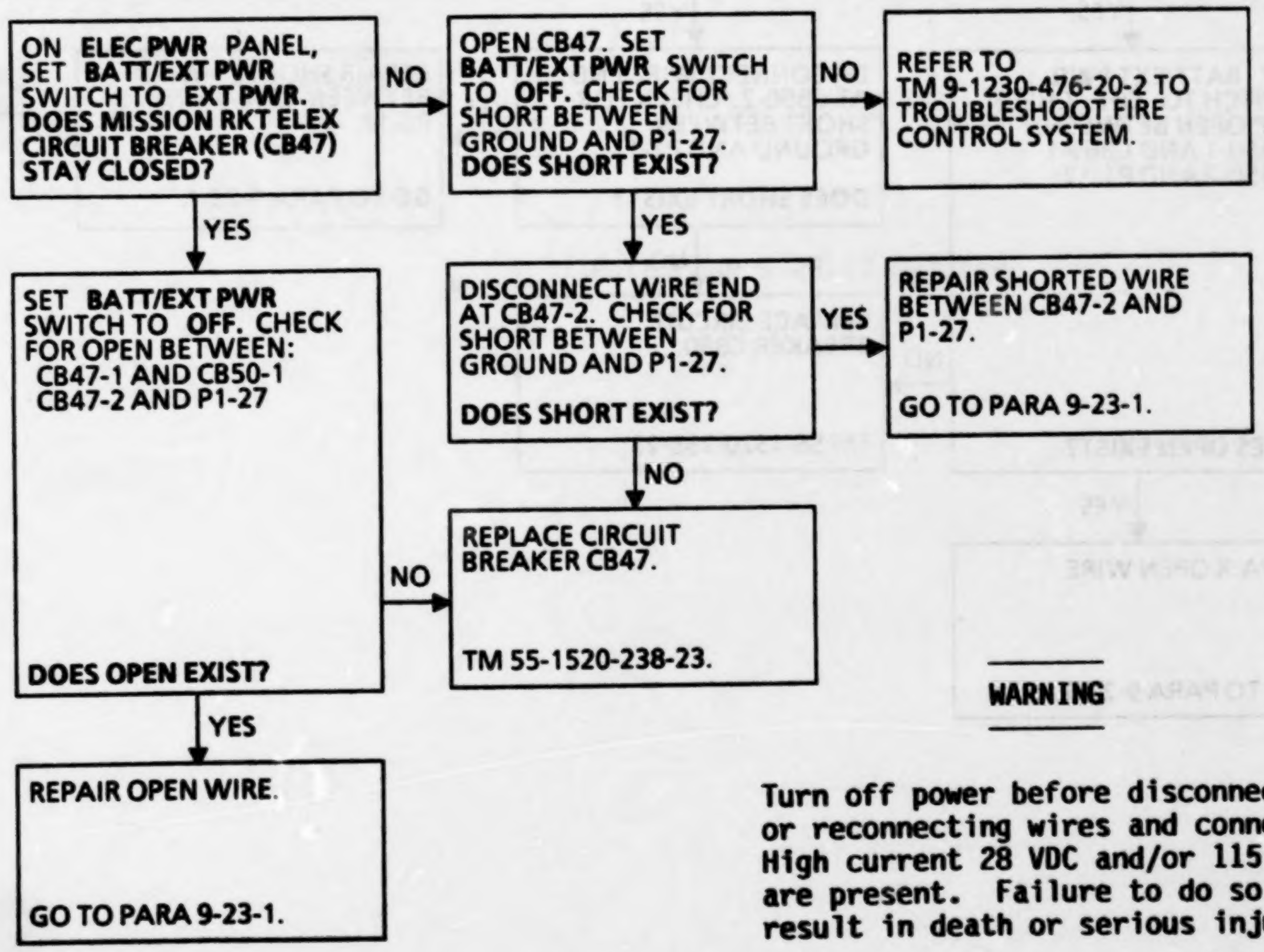
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION RKT ELEX CIRCUIT BREAKER (CB47) STAY CLOSED?
NO
OPEN CB47. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-27. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT FIRE CONTROL SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB47-1 AND CB50-1 CB47-2 AND P1-27
DISCONNECT WIRE END AT CB47-2. CHECK FOR SHORT BETWEEN GROUND AND P1-27.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB47-2 AND P1-27.
GO TO PARA 9-23-1.
NO
REPLACE CIRCUIT BREAKER CB47.
TM 55-1520-238-23.
NO
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-23-11. ASE DC CIRCUIT BREAKER (CB28) - DOES NOT STAY CLOSED OR 28 VDC TO ASE PANEL IS NOT PRESENT AT P1-34

Tools: (para 9-23-10)

Personnel Required: (para 9-23-10)

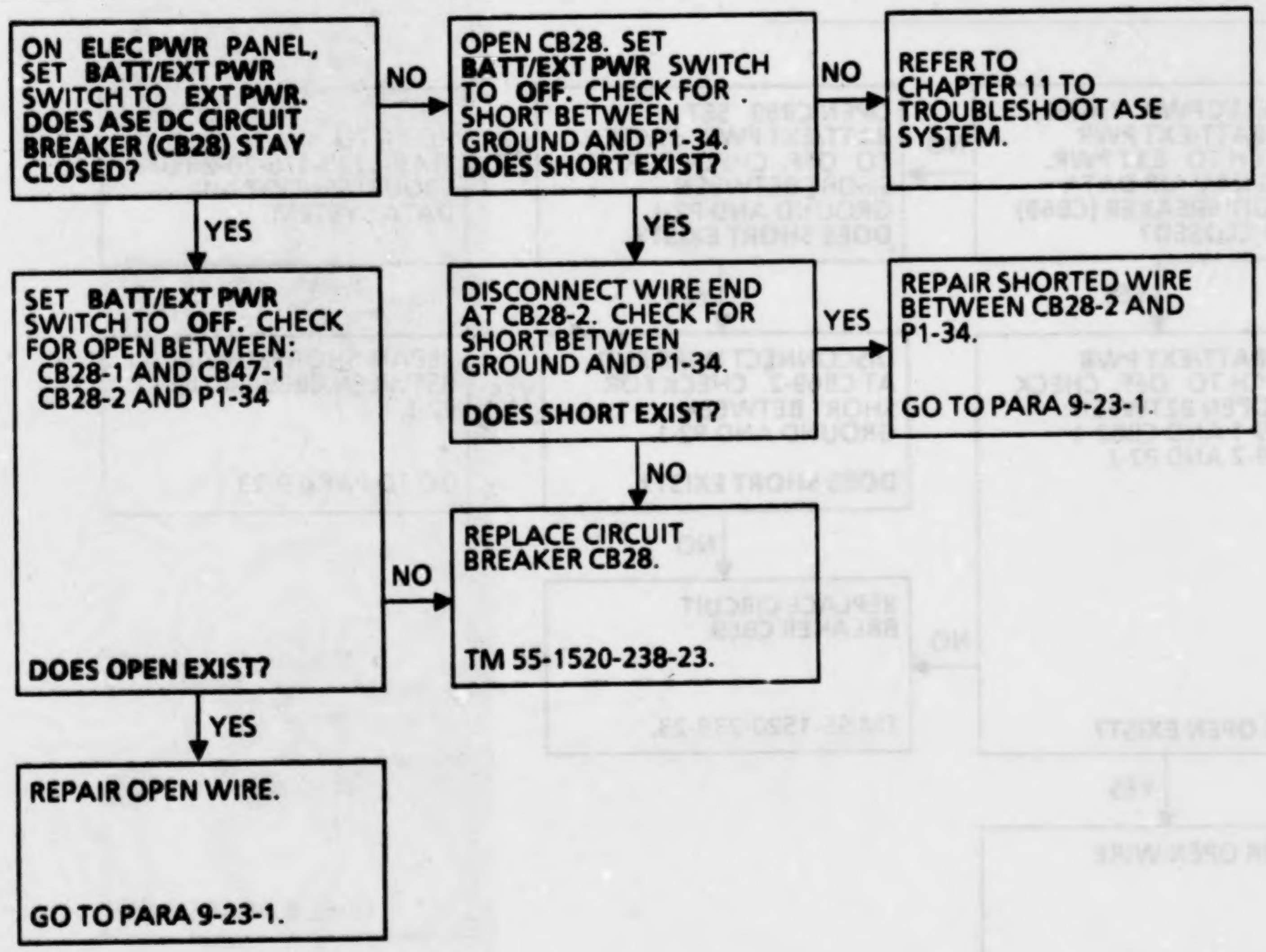
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-23-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ASE DC CIRCUIT BREAKER (CB28) STAY CLOSED?
NO
OPEN CB28. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-34. DOES SHORT EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT ASE SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB28-1 AND CB47-1 CB28-2 AND P1-34
DISCONNECT WIRE END AT CB28-2. CHECK FOR SHORT BETWEEN GROUND AND P1-34.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB28-2 AND P1-34.
GO TO PARA 9-23-1.
NO
REPLACE CIRCUIT BREAKER CB28.
TM 55-1520-238-23.
NO
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

END OF TASK

9-23-12. ASE BUCS CIRCUIT BREAKER (CB77) - DOES NOT STAY CLOSED OR 28 VDC TO DASEC IS NOT PRESENT AT P1-33

Paragraph 9-23-12 deleted.

9-23-13. ECS ICE DET CIRCUIT BREAKER (CB68) - DOES NOT STAY CLOSED OR 28 VDC TO ICE DETECTOR SIGNAL PROCESSOR IS NOT PRESENT AT P1-47

Tools: (para 9-23-10)

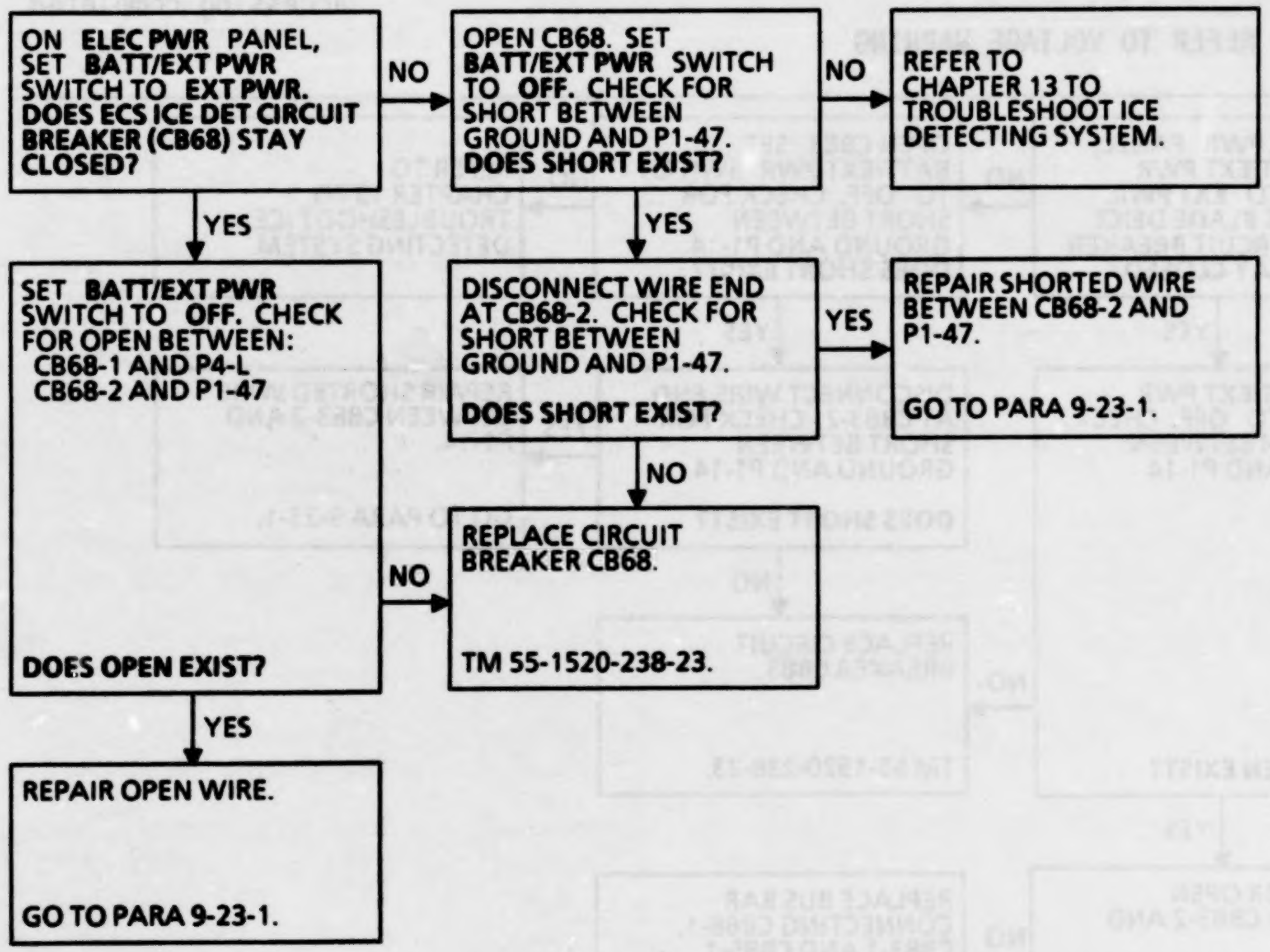
Personnel Required: (para 9-23-10)

References: (para 9-23-11)

Equipment Conditions: (para 9-23-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS ICE DET CIRCUIT BREAKER (CB68) STAY CLOSED?
NO
OPEN CB68. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-47. DOES SHORT EXIST?
NO
REFER TO CHAPTER 13 TO TROUBLESHOOT ICE DETECTING SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB68-1 AND P4-L CB68-2 AND P1-47
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB68-2. CHECK FOR SHORT BETWEEN GROUND AND P1-47.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB68-2 AND P1-47.
GO TO PARA 9-23-1.
NO
NO
REPLACE CIRCUIT BREAKER CB68.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

END OF TASK

9-23-14. ECS BLADE DEICE CONTR CIRCUIT BREAKER (CB83) - DOES NOT STAY CLOSED OR 28 VDC TO ROTOR BLADE DEICE CONTROLLER IS NOT PRESENT AT P1-14

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

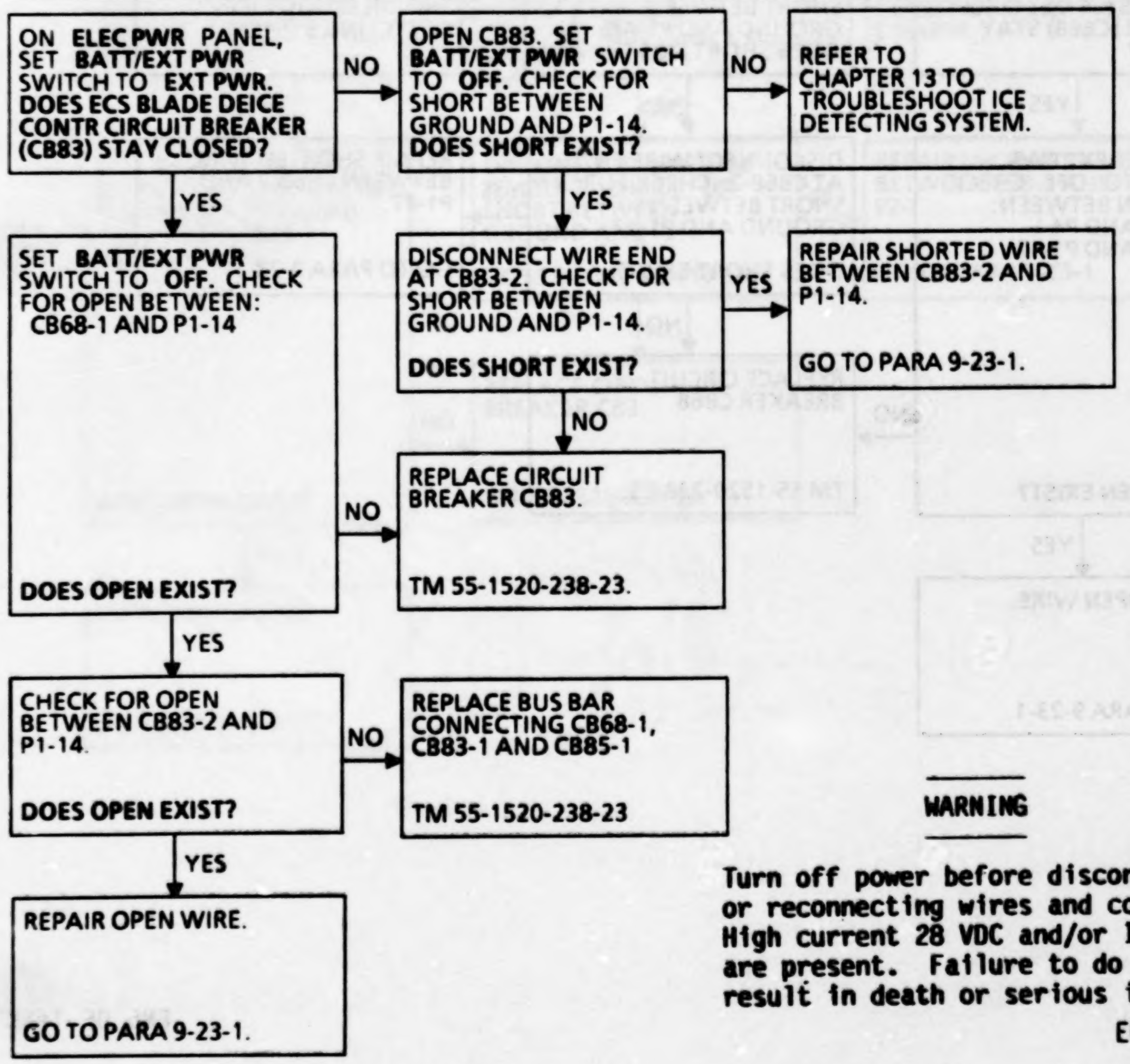
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS BLADE DEICE CONTR CIRCUIT BREAKER (CB83) STAY CLOSED?

NO: OPEN CB83. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-14. DOES SHORT EXIST?

NO: REFER TO CHAPTER 13 TO TROUBLESHOOT ICE DETECTING SYSTEM.

YES: DISCONNECT WIRE END AT CB83-2. CHECK FOR SHORT BETWEEN GROUND AND P1-14. DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN CB83-2 AND P1-14. GO TO PARA 9-23-1.

NO: REPLACE CIRCUIT BREAKER CB83. TM 55-1520-238-23.

YES: SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB68-1 AND P1-14 DOES OPEN EXIST?

NO: REPLACE CIRCUIT BREAKER CB83. TM 55-1520-238-23.

YES: CHECK FOR OPEN BETWEEN CB83-2 AND P1-14. DOES OPEN EXIST?

NO: REPLACE BUS BAR CONNECTING CB68-1, CB83-1 AND CB85-1 TM 55-1520-238-23

YES: REPAIR OPEN WIRE. GO TO PARA 9-23-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-23-15. ECS BLADE DEICE CIRCUIT BREAKER (CB85) - DOES NOT STAY CLOSED OR 28 VDC TO BLADE DEICE CONTACTOR IS NOT PRESENT AT P1-53

Tools: (para 9-23-14)

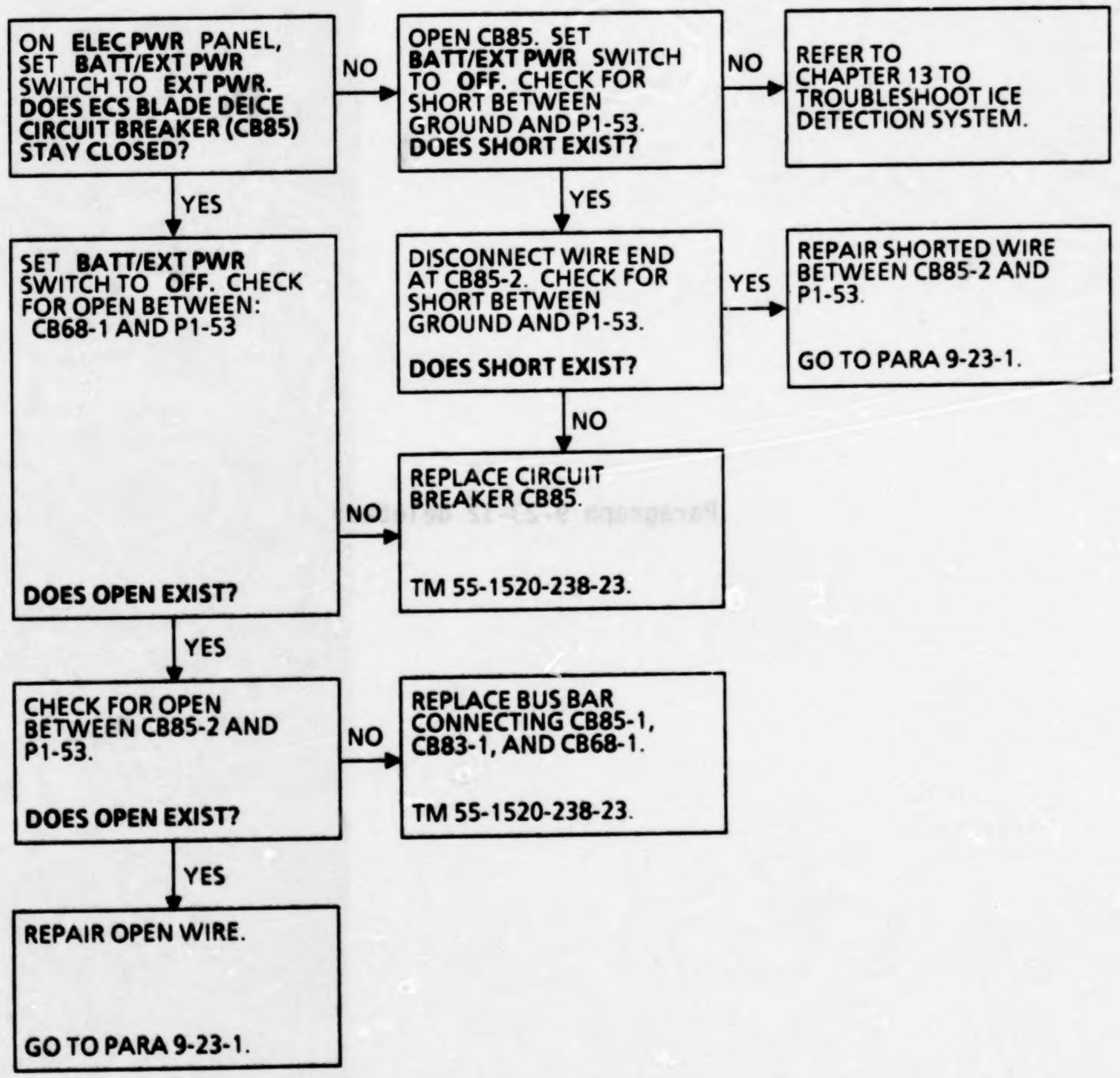
Personnel Required: (para 9-23-14)

References: (para 9-23-14)

Equipment Conditions: (para 9-23-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS BLADE DEICE CIRCUIT BREAKER (CB85) STAY CLOSED?

NO: OPEN CB85. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-53. DOES SHORT EXIST?

NO: REFER TO CHAPTER 13 TO TROUBLESHOOT ICE DETECTION SYSTEM.

YES: DISCONNECT WIRE END AT CB85-2. CHECK FOR SHORT BETWEEN GROUND AND P1-53. DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN CB85-2 AND P1-53. GO TO PARA 9-23-1.

NO: REPLACE CIRCUIT BREAKER CB85. TM 55-1520-238-23.

YES: SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB68-1 AND P1-53 DOES OPEN EXIST?

NO: REPLACE CIRCUIT BREAKER CB85. TM 55-1520-238-23.

YES: CHECK FOR OPEN BETWEEN CB85-2 AND P1-53. DOES OPEN EXIST?

NO: REPLACE BUS BAR CONNECTING CB85-1, CB83-1, AND CB68-1. TM 55-1520-238-23.

YES: REPAIR OPEN WIRE. GO TO PARA 9-23-1.

END OF TASK

9-23-16. STAB AUTO DC CIRCUIT BREAKER (CB3) - DOES NOT STAY CLOSED OR 28 VDC TO STABILATOR CONTROL UNIT IS NOT PRESENT AT P2-f

Tools: (para 9-22-14)

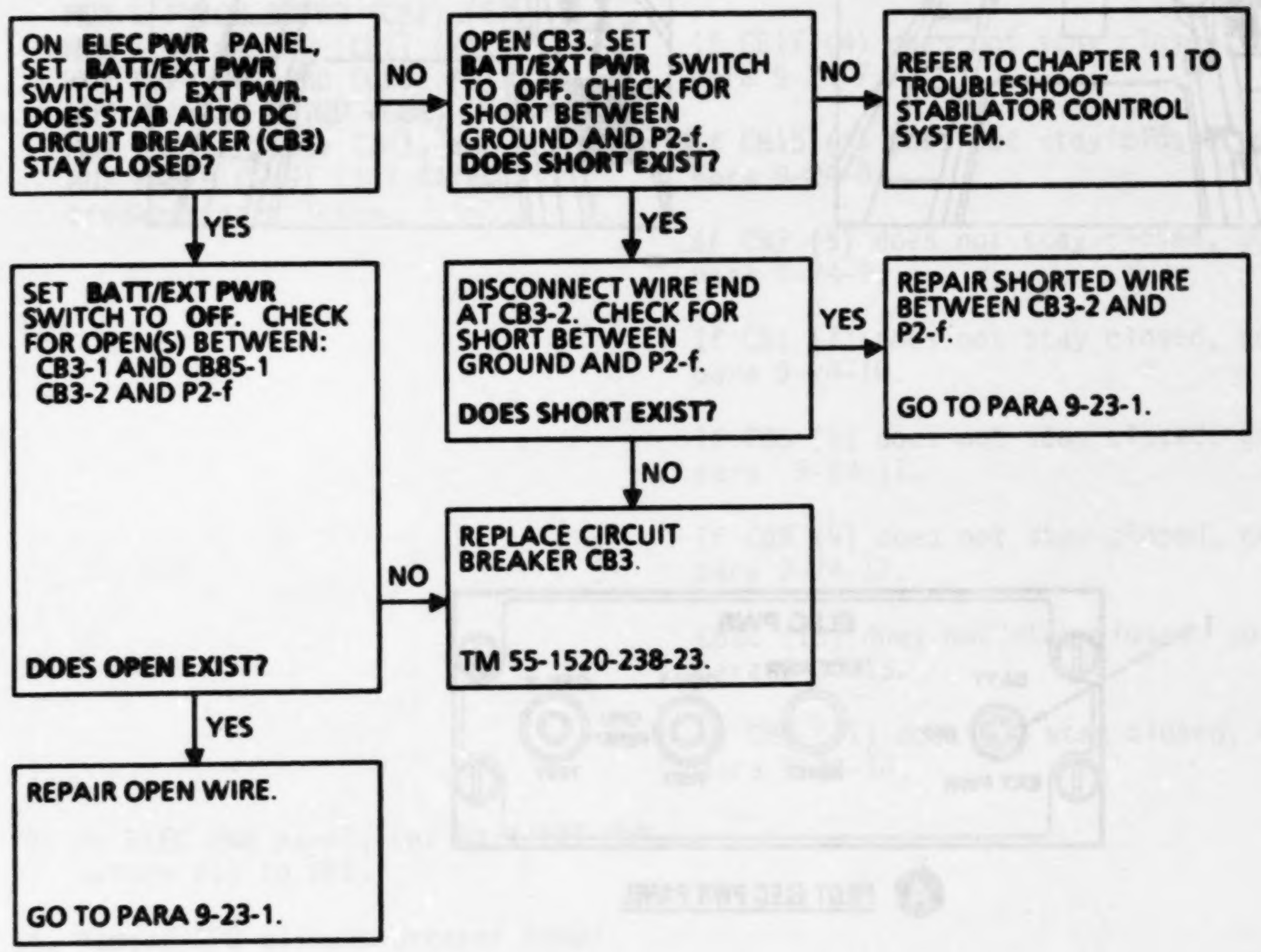
Personnel Required: (para 9-22-14)

References: (para 9-22-14)

Equipment Conditions: (para 9-22-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES STAB AUTO DC CIRCUIT BREAKER (CB3) STAY CLOSED?
NO
OPEN CB3. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-f. DOES SHORT EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR CONTROL SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN(S) BETWEEN: CB3-1 AND CB85-1 CB3-2 AND P2-f
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB3-2. CHECK FOR SHORT BETWEEN GROUND AND P2-f.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB3-2 AND P2-f.
GO TO PARA 9-23-1.
NO
REPLACE CIRCUIT BREAKER CB3.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

END OF TASK

9-24-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

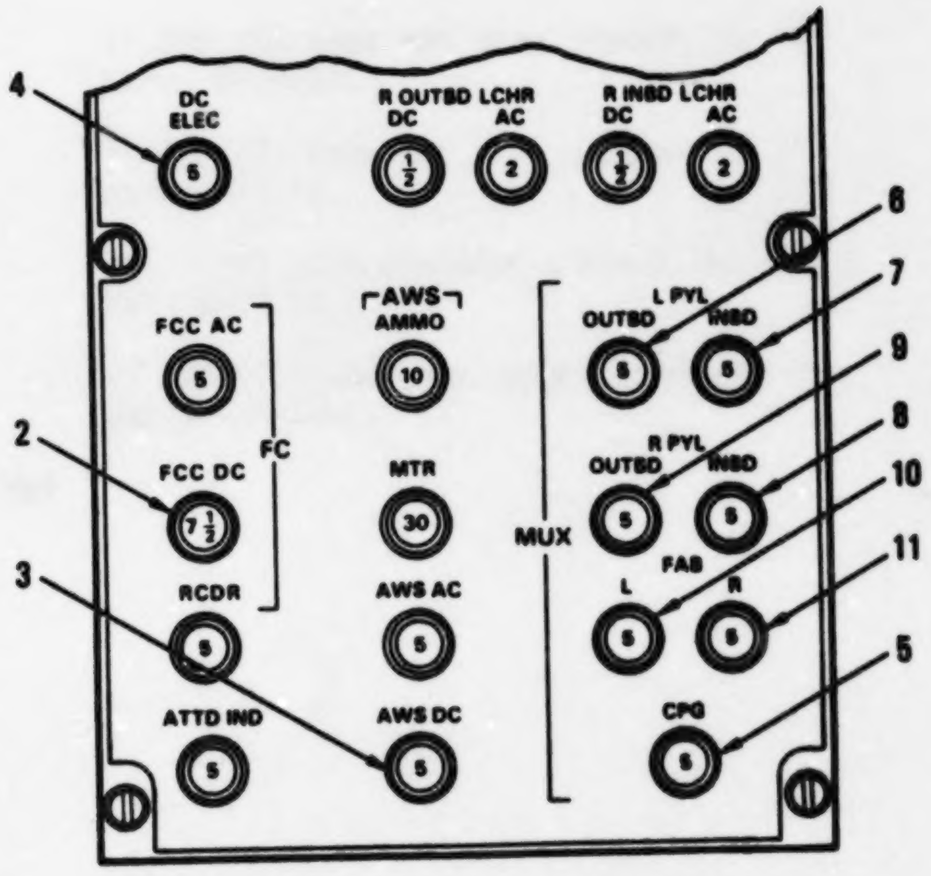
TM 55-1520-238-23

Equipment Conditions:

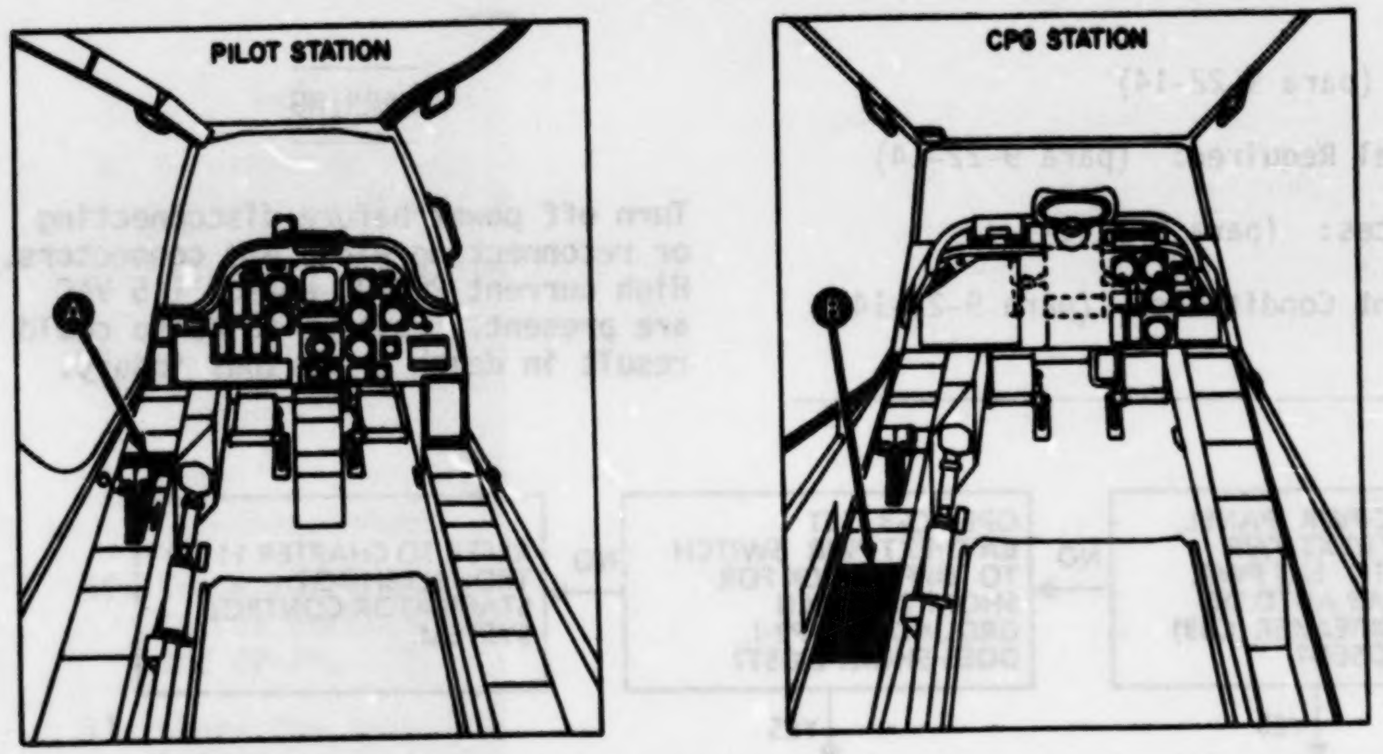
Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

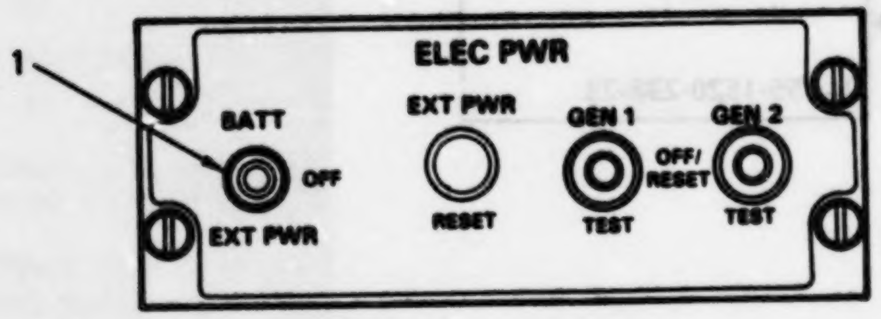
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


4
DC ELEC
5
R OUTBD DC
½
LCHR AC
2
R INBD DC
½
LCHR AC
2
6
7
FCC AC
5
AWS AMMO
10
L PYL
OUTBD
INBD
5
5
9
8
2
FCC DC
7½
FC
MTR
30
R PYL
OUTBD
INBD
MUX
10
11
FAB
L
R
3
RCDR
AWS AC
ATTD IND
AWS DC
CPG
5

B CPG CIRCUIT BREAKER PANEL NO. 1


PILOT STATION
A
CPG STATION
B


1
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
TEST
OFF/RESET
GEN 2
TEST

A PILOT ELEC PWR PANEL

MM04/1-1014A

GO TO NEXT PAGE

9-24-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - OPERATIONAL CHECK (cont)

A. Perform operational as follows:

TASK	RESULT
1. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
2. On CPG circuit breaker panel No. 1, check that the **FC FCC DC** (CB4) (2), **AWS AWS DC** (CB12) (3), **MSL DC ELEC** (CB17) (4), **MUX CPG** (CB15) (5), **MUX L PYLON OUTBD** (CB2) (6), **MUX L PYLON IND** (CB1) (7), **MUX R PYLON INBD** (CB5) (8), **MUX R PYLON OUTBD** (CB6) (9), **MUX FAB L** (CB10) (10), and **MUX FAB R** (CB9) (11) circuit breakers are closed.	If CB4 (2) does not stay closed, go to para 9-24-5 If CB12 (3) does not stay closed, go to para 9-24-6. If CB17 (4) does not stay closed, go to para 9-24-7. If CB15 (5) does not stay closed, go to para 9-24-8. If CB2 (6) does not stay closed, go to para 9-24-9. If CB1 (7) does not stay closed, go to para 9-24-10. If CB5 (8) does not stay closed, go to para 9-24-11. If CB6 (9) does not stay closed, go to para 9-24-12. CB10 (10) does not stay closed, go to para 9-24-13. If CB9 (11) does not stay closed, go to para 9-24-14.
3. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
4. Remove CPG circuit breaker panel No. 1 (TM 55-1520-238-23).	
5. Disconnect J767 and J769.	
6. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
7. Check for 28 VDC at J769-J, -A.	If 28 VDC is not present, go to para 9-24-4.
8. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
9. Check for continuity to fire control computer between J4-J and J2-32.	If continuity does not exist, go to para 9-24-5.
10. Check for continuity to gun and turret control boxes between J4-J and J2-24, -33.	If continuity does not exist, go to para 9-24-6.
11. Check for continuity to remote hellfire electronics between J4-J and J2-20, -21.	If continuity does not exist, go to para 9-24-7.
12. Check for continuity to CPG MRTU type III between J4-A and J2-7.	If continuity does not exist, go to para 9-24-8.
13. Check for continuity to pylon MRTU type II between J4-A and J2-11.	If continuity does not exist, go to para 9-24-9.
14. Check for continuity to pylon MRTU Type II between J4-A and J2-9.	If continuity does not exist, go to para 9-24-10.
15. Check for continuity to pylon MRTU type II between J4-A and J2-8.	If continuity does not exist, go to para 9-24-11.
16. Check for continuity to pylon MRTU type II between J4-A and J2-10.	If continuity does not exist, go to para 9-24-12.
17. Check for continuity to left hand FAB MRTU type I between J4-A and J2-14.	If continuity does not exist, go to para 9-24-13.
18. Check for continuity to right hand FAB MRTU type I between J4-A and J2-13.	If continuity does not exist, go to para 9-24-14.

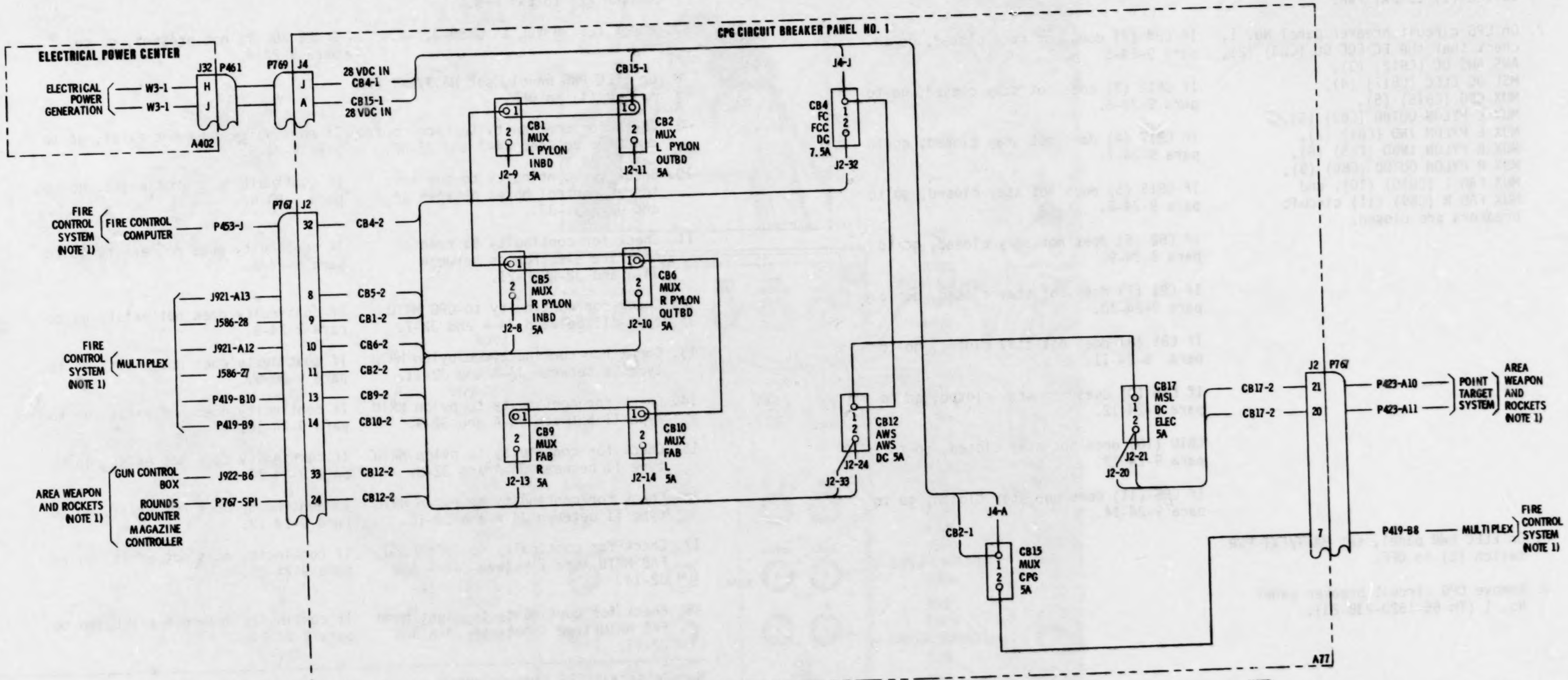
B. Reinstall CPG circuit breaker panel No. 1 (TM 55-1520-238-23).

C. Reconnect J767 and J769.

D. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-24-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - INTERCONNECTION DIAGRAM

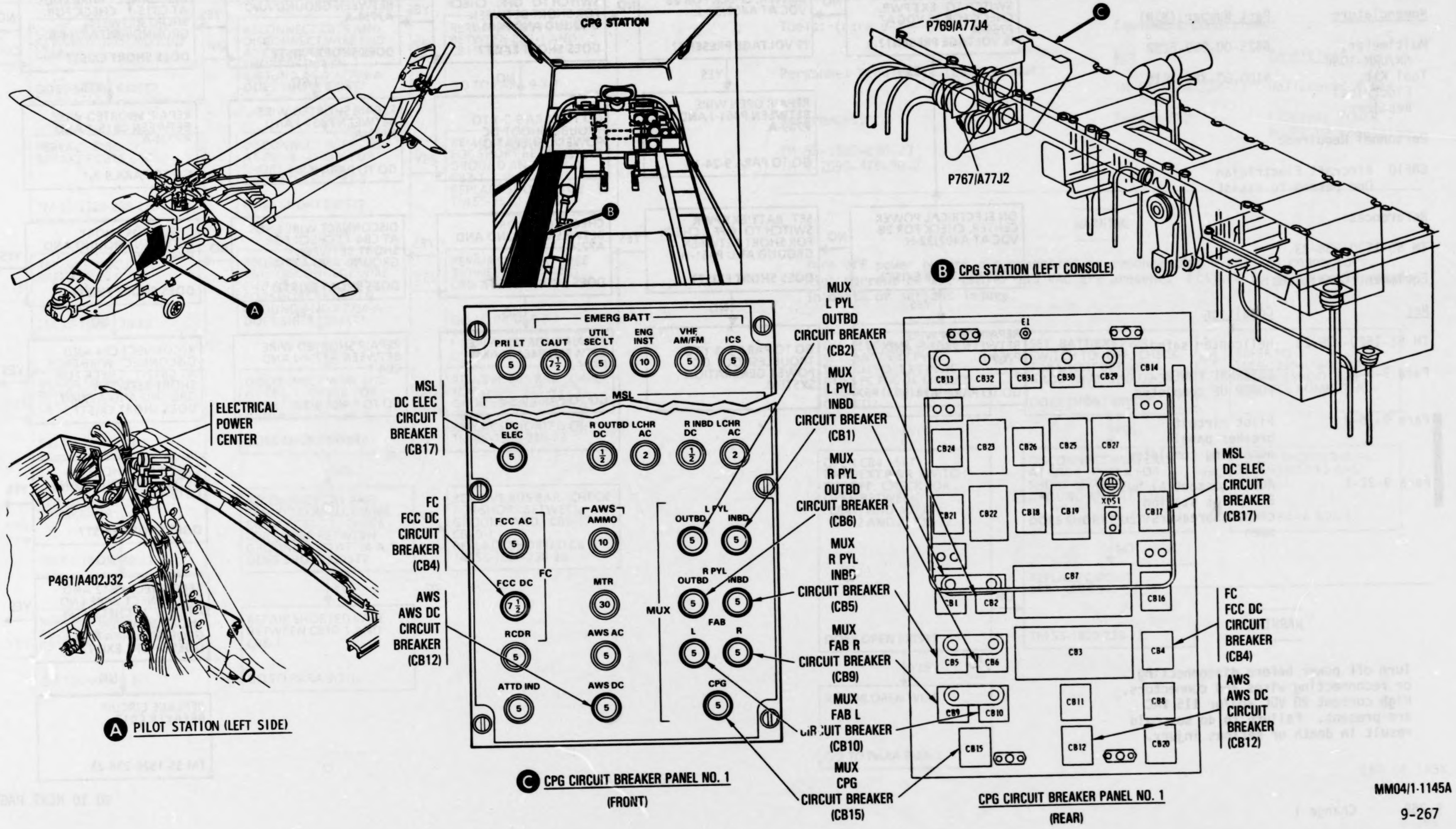

ELECTRICAL POWER CENTER
ELECTRICAL POWER GENERATION
W3-1
W3-1
J32
P461
H
J
A402
P769
J4
J
A
28 VDC IN
CB4-1
CB15-1
28 VDC IN
CPG CIRCUIT BREAKER PANEL NO. 1
CB15-1
1
2
CB1 MUX L PYLON INBD 5A
J2-9
CB2 MUX L PYLON OUTBD 5A
J2-11
J4-J
CB4 FC FCC DC 7.5A
J2-32
FIRE CONTROL SYSTEM (NOTE 1)
FIRE CONTROL COMPUTER
P453-J
P767
J2
32
CB4-2
CB5 MUX R PYLON INBD 5A
J2-8
CB6 MUX R PYLON OUTBD 5A
J2-10
FIRE CONTROL SYSTEM (NOTE 1)
MULTIPLEX
J921-A13
J586-28
J921-A12
J586-27
P419-B10
P419-B9
8
9
10
11
13
14
CB5-2
CB1-2
CB6-2
CB2-2
CB9-2
CB10-2
CB9 MUX FAB R 5A
J2-13
CB10 MUX FAB L 5A
J2-14
CB12 AWS AWS DC 5A
J2-24
J2-33
AREA WEAPON AND ROCKETS (NOTE 1)
GUN CONTROL BOX
ROUNDS COUNTER MAGAZINE CONTROLLER
J922-B6
P767-SP1
33
24
CB12-2
CB12-2
J4-A
CB2-1
CB15 MUX CPG 5A
CB17 MSL DC ELEC 5A
J2-21
J2-20
CB17-2
CB17-2
J2
P767
21
20
7
P423-A10
P423-A11
POINT TARGET SYSTEM
AREA WEAPON AND ROCKETS (NOTE 1)
P419-B8
MULTIPLEX
FIRE CONTROL SYSTEM (NOTE 1)
A77

NOTE.

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-767A

9-24-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


CPG STATION
B
A
ELECTRICAL POWER CENTER
P461/A402J32
A PILOT STATION (LEFT SIDE)
C
P769/A77J4
P767/A77J2
B CPG STATION (LEFT CONSOLE)
EMERG BATT
PRI LT 5
CAUT 7½
UTIL SEC LT 5
ENG INST 10
VHF AM/FM 5
ICS 5
MSL
DC ELEC 5
R OUTBD DC ½
LCHR AC 2
R INBD DC ½
LCHR AC 2
FCC AC 5
AWS AMMO 10
L PYL
OUTBD 5
INBD 5
FC
FCC DC 7½
MTR 30
R PYL
OUTBD 5
INBD 5
MUX
FAB
RCDR 5
AWS AC 5
L 5
R 5
ATTD IND 5
AWS DC 5
CPG 5
MSL DC ELEC CIRCUIT BREAKER (CB17)
FC FCC DC CIRCUIT BREAKER (CB4)
AWS AWS DC CIRCUIT BREAKER (CB12)
C CPG CIRCUIT BREAKER PANEL NO. 1
(FRONT)
MUX L PYL OUTBD CIRCUIT BREAKER (CB2)
MUX L PYL INBD CIRCUIT BREAKER (CB1)
MUX R PYL OUTBD CIRCUIT BREAKER (CB6)
MUX R PYL INBD CIRCUIT BREAKER (CB5)
MUX FAB R CIRCUIT BREAKER (CB9)
MUX FAB L CIRCUIT BREAKER (CB10)
MUX CPG CIRCUIT BREAKER (CB15)
E1
CB13
CB32
CB31
CB30
CB29
CB14
CB24
CB23
CB26
CB25
CB27
CB21
CB22
CB18
CB19
XDS1
CB17
CB7
CB1
CB2
CB16
CB5
CB6
CB3
CB4
CB9
CB10
CB11
CB8
CB15
CB12
CB20
CPG CIRCUIT BREAKER PANEL NO. 1
(REAR)
MSL DC ELEC CIRCUIT BREAKER (CB17)
FC FCC DC CIRCUIT BREAKER (CB4)
AWS AWS DC CIRCUIT BREAKER (CB12)
MM04/1-1145A

9-24-4. 28 VDC - IS NOT PRESENT AT P769-A, -J

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

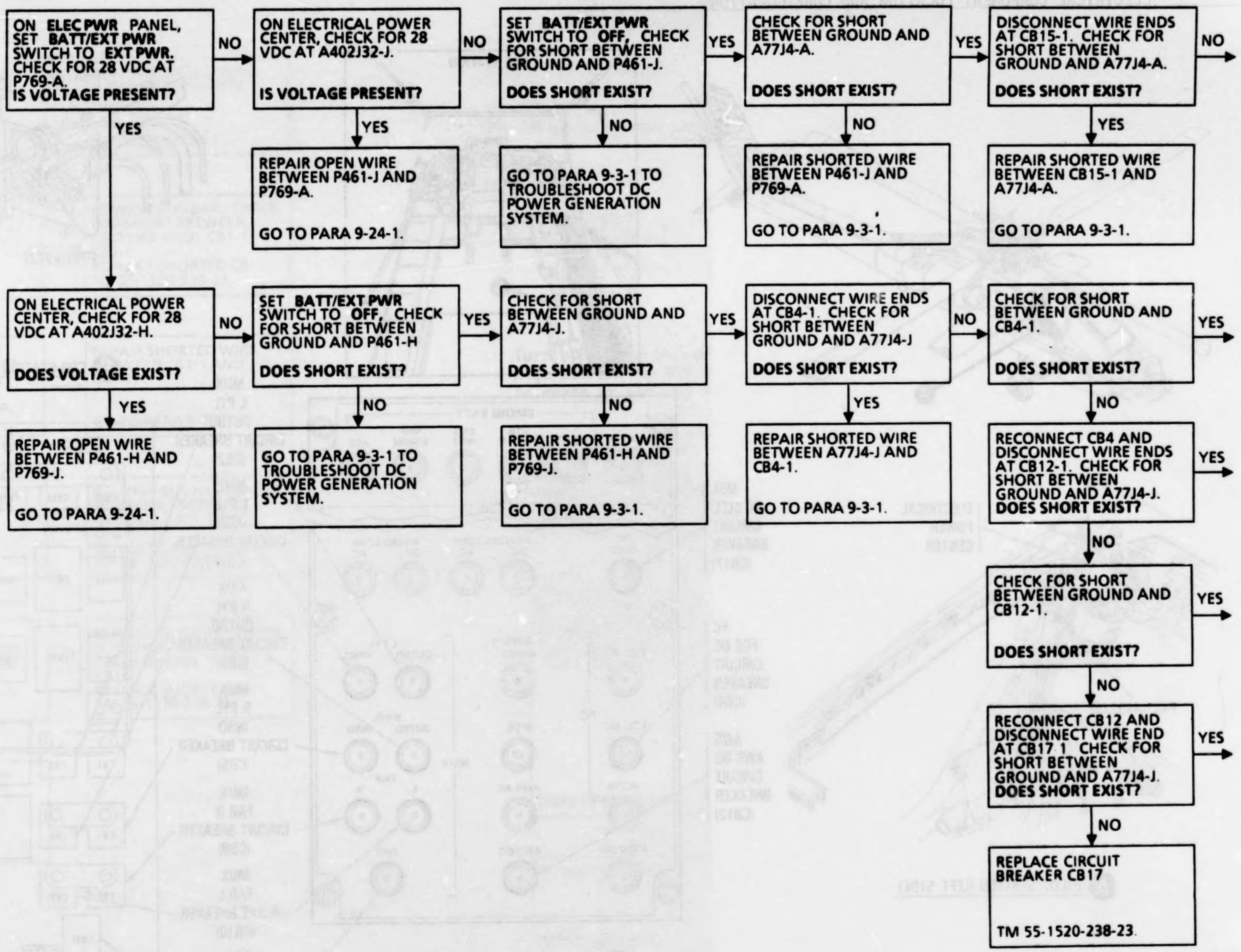
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-22-1	ALL DC essential bus 2 - pilot station circuit breakers open

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. CHECK FOR 28 VDC AT P769-A. IS VOLTAGE PRESENT?

ON ELECTRICAL POWER CENTER, CHECK FOR 28 VDC AT A402J32-J. IS VOLTAGE PRESENT?

SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P461-J. DOES SHORT EXIST?

CHECK FOR SHORT BETWEEN GROUND AND A77J4-A. DOES SHORT EXIST?

DISCONNECT WIRE ENDS AT CB15-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-A. DOES SHORT EXIST?

REPAIR OPEN WIRE BETWEEN P461-J AND P769-A. GO TO PARA 9-24-1.

GO TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION SYSTEM.

REPAIR SHORTED WIRE BETWEEN P461-J AND P769-A. GO TO PARA 9-3-1.

REPAIR SHORTED WIRE BETWEEN CB15-1 AND A77J4-A. GO TO PARA 9-3-1.

ON ELECTRICAL POWER CENTER, CHECK FOR 28 VDC AT A402J32-H. DOES VOLTAGE EXIST?

SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P461-H DOES SHORT EXIST?

CHECK FOR SHORT BETWEEN GROUND AND A77J4-J. DOES SHORT EXIST?

DISCONNECT WIRE ENDS AT CB4-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-J DOES SHORT EXIST?

CHECK FOR SHORT BETWEEN GROUND AND CB4-1. DOES SHORT EXIST?

REPAIR OPEN WIRE BETWEEN P461-H AND P769-J. GO TO PARA 9-24-1.

GO TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION SYSTEM.

REPAIR SHORTED WIRE BETWEEN P461-H AND P769-J. GO TO PARA 9-3-1.

REPAIR SHORTED WIRE BETWEEN A77J4-J AND CB4-1. GO TO PARA 9-3-1.

RECONNECT CB4 AND DISCONNECT WIRE ENDS AT CB12-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-J. DOES SHORT EXIST?

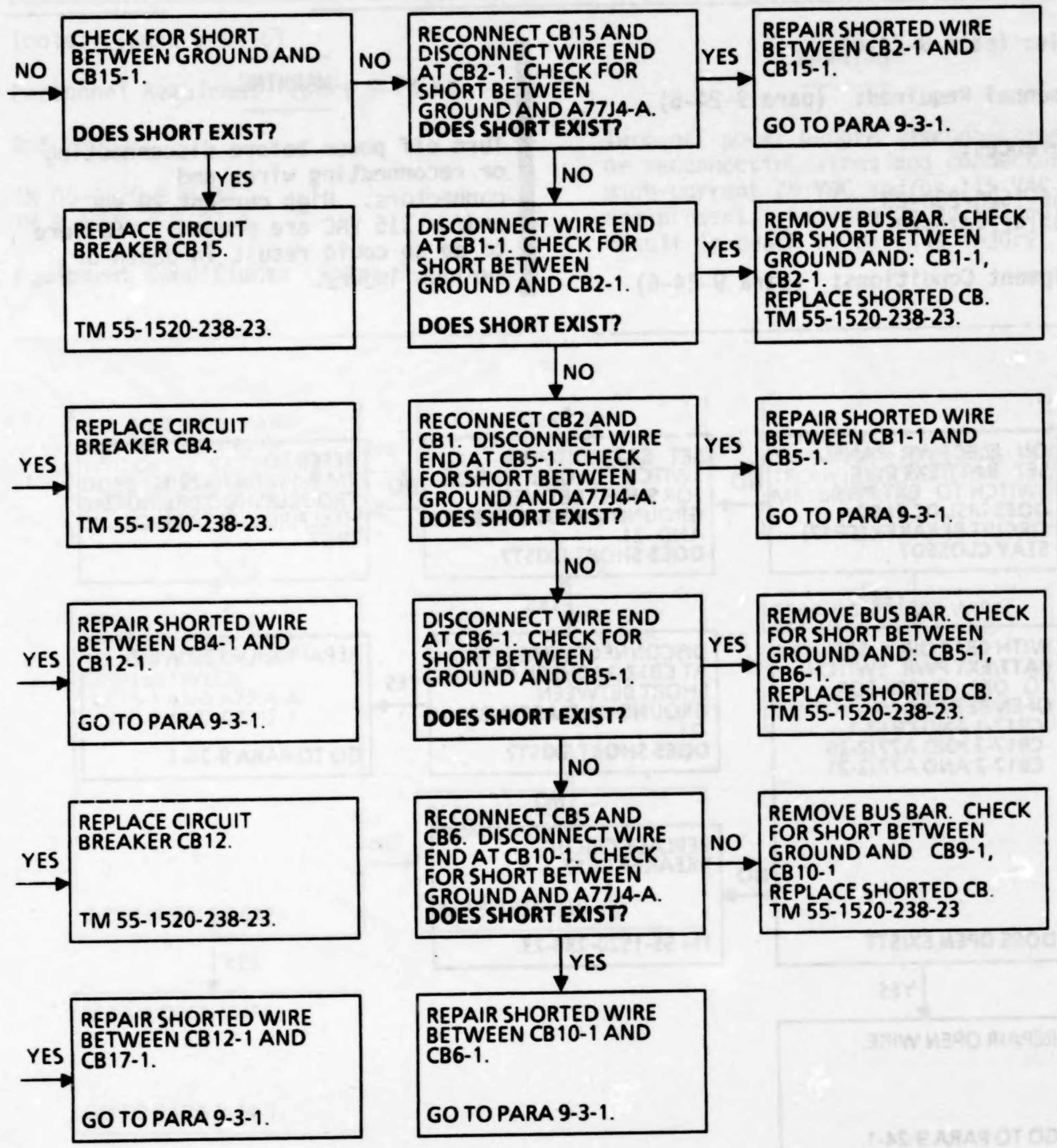
CHECK FOR SHORT BETWEEN GROUND AND CB12-1. DOES SHORT EXIST?

RECONNECT CB12 AND DISCONNECT WIRE END AT CB17 1 CHECK FOR SHORT BETWEEN GROUND AND A77J4-J. DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB17 TM 55-1520-238-23.

GO TO NEXT PAGE

9-24-4. 28 VDC - IS NOT PRESENT AT P769-A, -J (cont)



CHECK FOR SHORT BETWEEN GROUND AND CB15-1.
DOES SHORT EXIST?

RECONNECT CB15 AND DISCONNECT WIRE END AT CB2-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-A.
DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB2-1 AND CB15-1.
GO TO PARA 9-3-1.

REPLACE CIRCUIT BREAKER CB15.
TM 55-1520-238-23.

DISCONNECT WIRE END AT CB1-1. CHECK FOR SHORT BETWEEN GROUND AND CB2-1.
DOES SHORT EXIST?

REMOVE BUS BAR. CHECK FOR SHORT BETWEEN GROUND AND: CB1-1, CB2-1.
REPLACE SHORTED CB.
TM 55-1520-238-23.

REPLACE CIRCUIT BREAKER CB4.
TM 55-1520-238-23.

RECONNECT CB2 AND CB1. DISCONNECT WIRE END AT CB5-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-A.
DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB1-1 AND CB5-1.
GO TO PARA 9-3-1.

REPAIR SHORTED WIRE BETWEEN CB4-1 AND CB12-1.
GO TO PARA 9-3-1.

DISCONNECT WIRE END AT CB6-1. CHECK FOR SHORT BETWEEN GROUND AND CB5-1.
DOES SHORT EXIST?

REMOVE BUS BAR. CHECK FOR SHORT BETWEEN GROUND AND: CB5-1, CB6-1.
REPLACE SHORTED CB.
TM 55-1520-238-23.

REPLACE CIRCUIT BREAKER CB12.
TM 55-1520-238-23.

RECONNECT CB5 AND CB6. DISCONNECT WIRE END AT CB10-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-A.
DOES SHORT EXIST?

REMOVE BUS BAR. CHECK FOR SHORT BETWEEN GROUND AND CB9-1, CB10-1
REPLACE SHORTED CB.
TM 55-1520-238-23

REPAIR SHORTED WIRE BETWEEN CB12-1 AND CB17-1.
GO TO PARA 9-3-1.

REPAIR SHORTED WIRE BETWEEN CB10-1 AND CB6-1.
GO TO PARA 9-3-1.

END OF TASK

9-24-5. FC FCC DC CIRCUIT BREAKER (CB4) - DOES NOT STAY CLOSED OR CONTINUITY TO FIRE CONTROL COMPUTER DOES NOT EXIST BETWEEN J4-J AND J2032

Tools: (para 9-24-4)

Personnel Required: (para 9-24-4)

References:

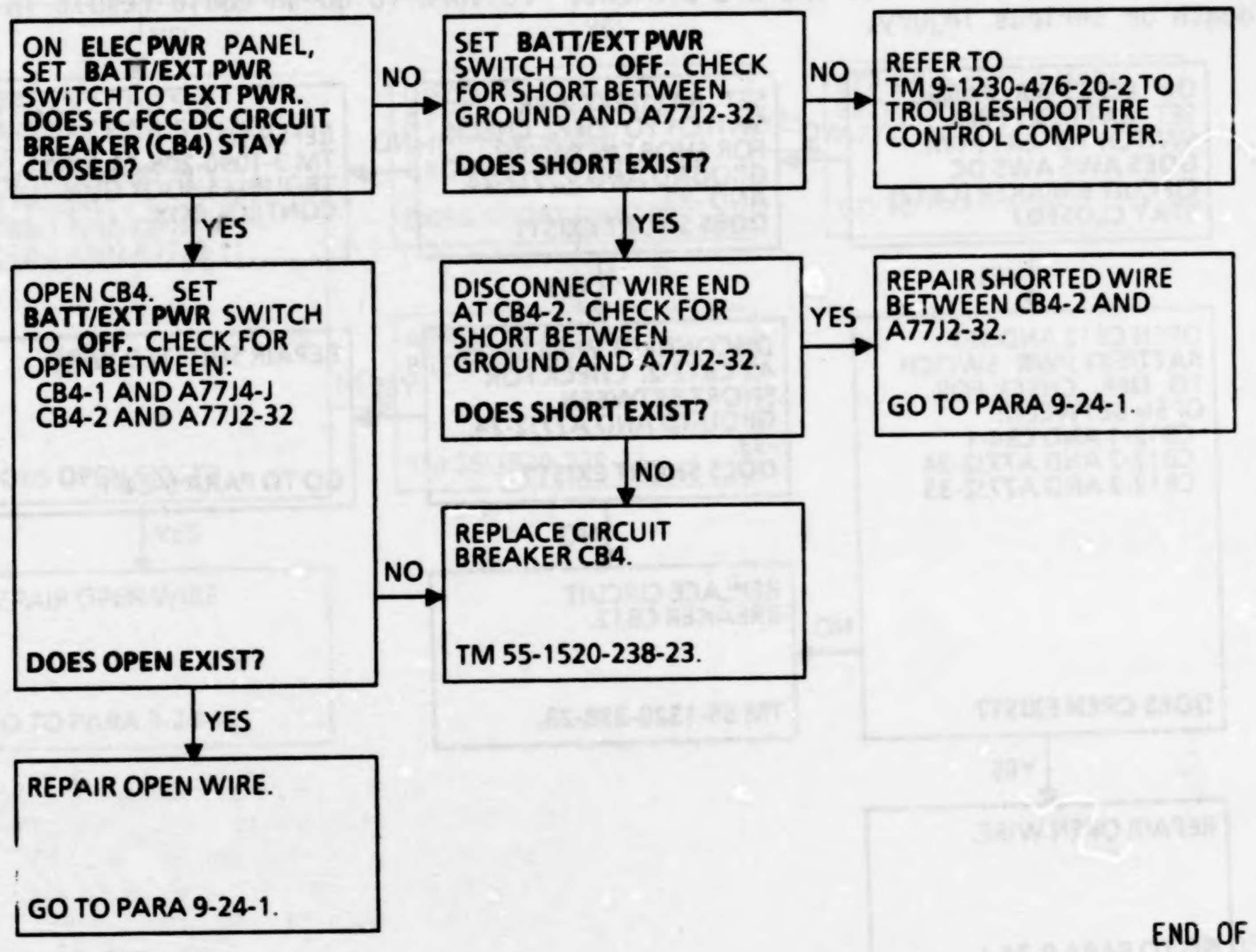
TM 55-1520-238-23
TM 9-1090-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR.
DOES FC FCC DC CIRCUIT BREAKER (CB4) STAY CLOSED?

SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-32.
DOES SHORT EXIST?

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT FIRE CONTROL COMPUTER.

OPEN CB4. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB4-1 AND A77J4-J
CB4-2 AND A77J2-32
DOES OPEN EXIST?

DISCONNECT WIRE END AT CB4-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-32.
DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB4-2 AND A77J2-32.
GO TO PARA 9-24-1.

REPLACE CIRCUIT BREAKER CB4.
TM 55-1520-238-23.

REPAIR OPEN WIRE.
GO TO PARA 9-24-1.

END OF TASK

9-24-6. AWS AWS DC CIRCUIT BREAKER (CB12) - DOES NOT STAY CLOSED OR CONTINUITY TO GUN AND TURRET CONTROL BOXES DOES NOT EXIST BETWEEN J4-J AND J2-24, -33

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	1580-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

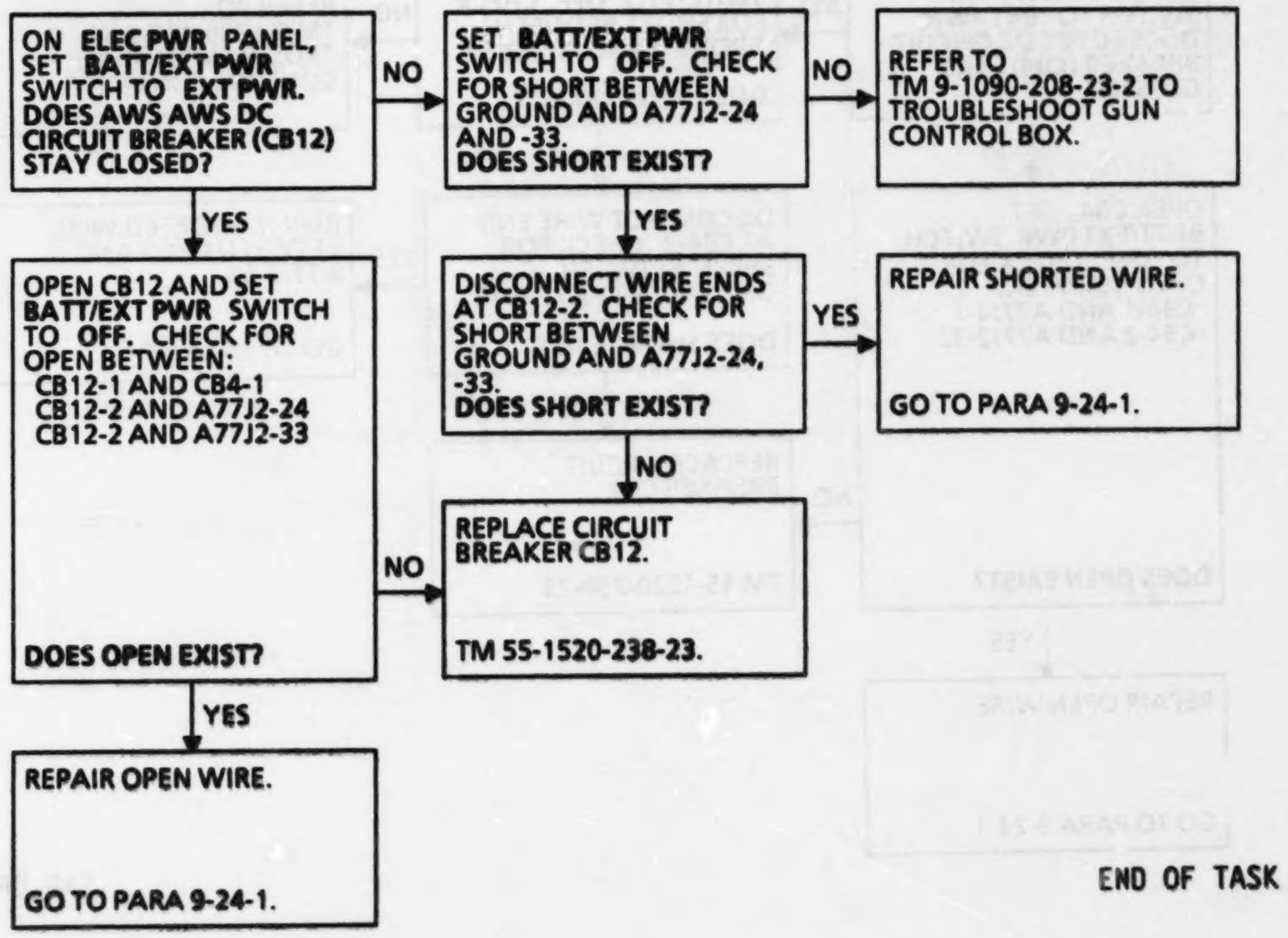
TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - CPG circuit breaker panels lowered
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES AWS AWS DC CIRCUIT BREAKER (CB12) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-24 AND -33. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT GUN CONTROL BOX.
YES
OPEN CB12 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB12-1 AND CB4-1 CB12-2 AND A77J2-24 CB12-2 AND A77J2-33 DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB12-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-24, -33. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-24-1.
NO
REPLACE CIRCUIT BREAKER CB12. TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

END OF TASK

9-24-7. MSL DC CIRCUIT BREAKER (CB17) - DOES NOT STAY CLOSED OR CONTINUITY TO REMOTE HELLFIRE ELECTRONICS UNIT DOES NOT EXIST BETWEEN J4-J AND J2-20, -21

Tools: (para 9-24-6)

Personnel Required: (para 9-24-6)

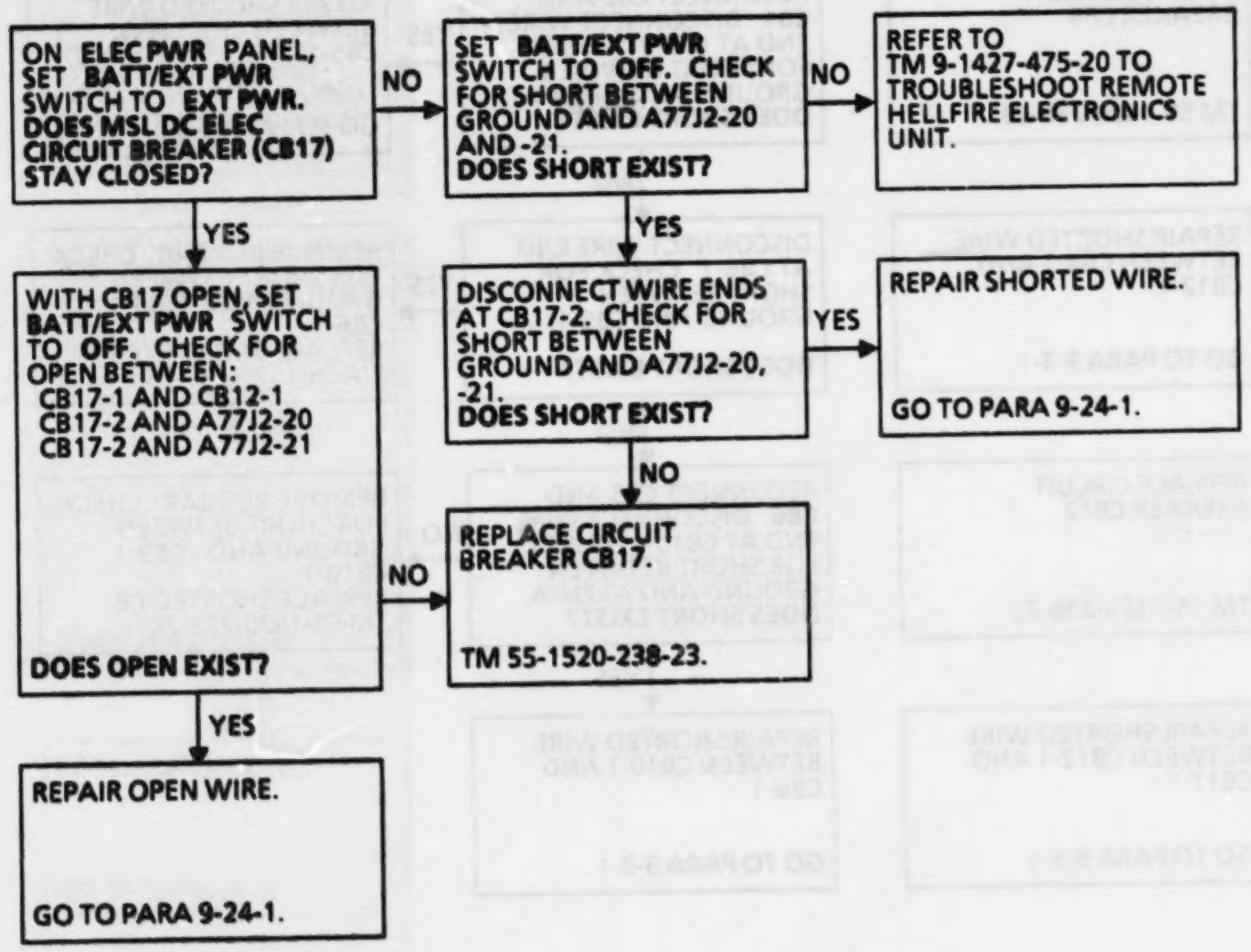
References:

TM 55-1520-238-23
TM 9-1427-475-20

Equipment Conditions: (para 9-24-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL DC ELEC CIRCUIT BREAKER (CB17) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-20 AND -21. DOES SHORT EXIST?
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT REMOTE HELLFIRE ELECTRONICS UNIT.
YES
WITH CB17 OPEN, SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB17-1 AND CB12-1 CB17-2 AND A77J2-20 CB17-2 AND A77J2-21 DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB17-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-20, -21. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-24-1.
NO
REPLACE CIRCUIT BREAKER CB17. TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

END OF TASK

9-24-8. MUX CPG CIRCUIT BREAKER (CB15) - DOES NOT STAY CLOSED OR CONTINUITY TO CPG MRTU TYPE III DOES NOT EXIST BETWEEN J4-A AND J2-7

Tools: (para 9-24-6)

Personnel Required: (para 9-24-6)

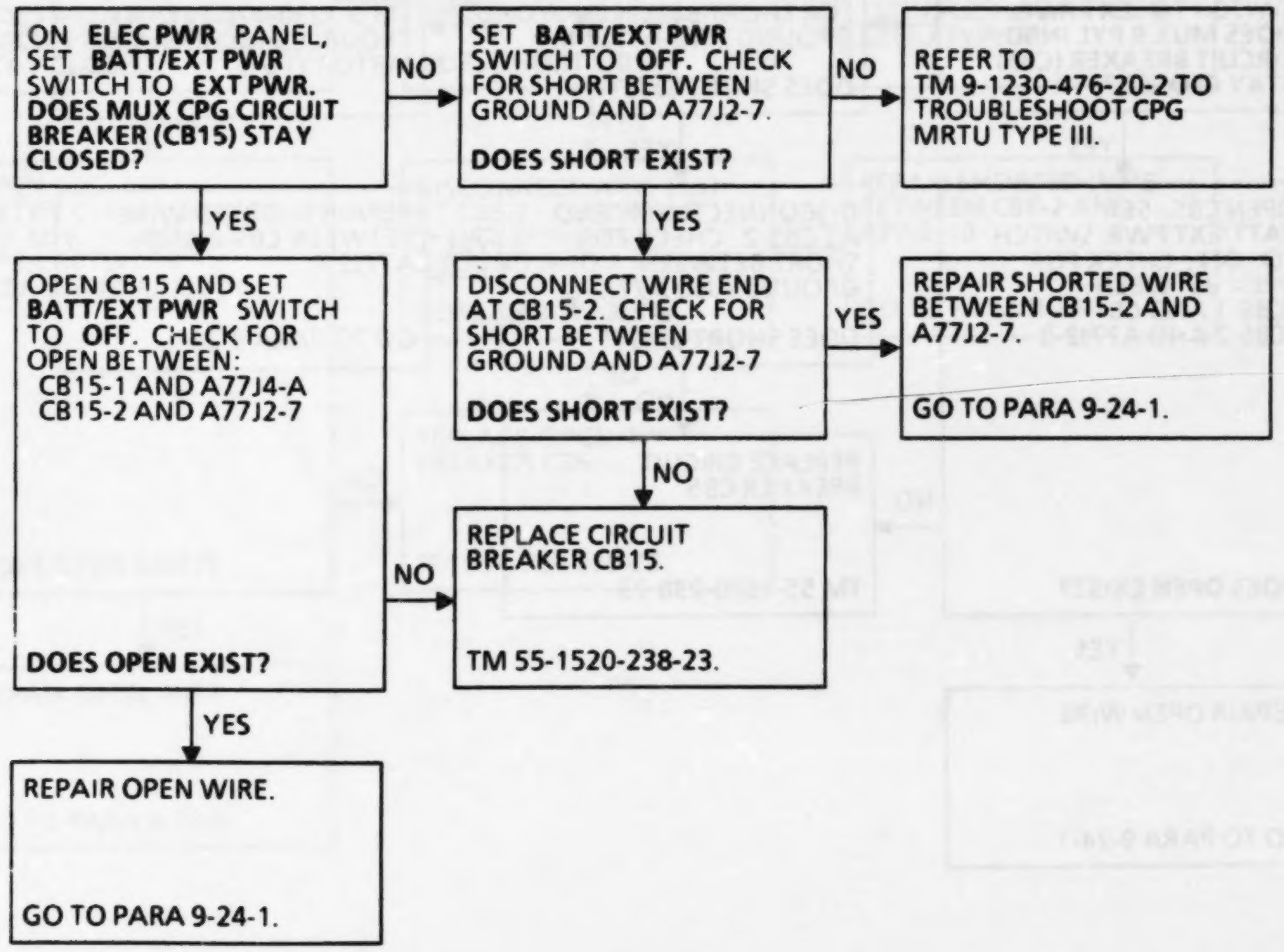
References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions: (para 9-24-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX CPG CIRCUIT BREAKER (CB15) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-7.
DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT CPG MRTU TYPE III.
YES
OPEN CB15 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB15-1 AND A77J4-A
CB15-2 AND A77J2-7
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB15-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-7
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB15-2 AND A77J2-7.
GO TO PARA 9-24-1.
NO
REPLACE CIRCUIT BREAKER CB15.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-24-1.

END OF TASK

9-24-9. MUX L PYL OUTBD CIRCUIT BREAKER (CB2) - DOES NOT STAY CLOSED OR CONTINUITY TO PYLON MRTU TYPE II DOES NOT EXIST BETWEEN J4-A AND J2-11

Tools: (para 9-24-6)

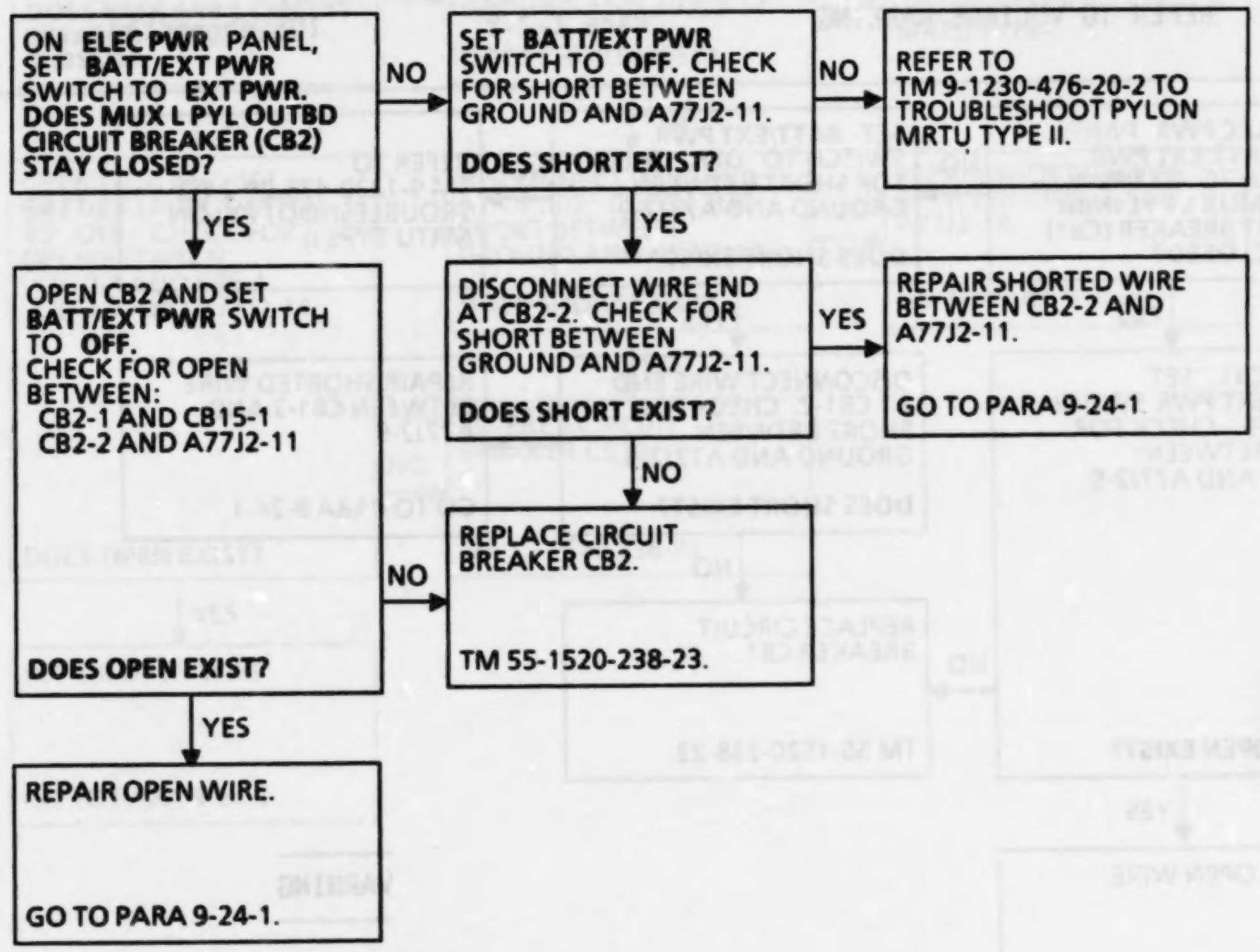
Personnel Required: (para 9-24-6)

References: (para 9-24-8)

Equipment Conditions: (para 9-24-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX L PYL OUTBD CIRCUIT BREAKER (CB2) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-11.
DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT PYLON MRTU TYPE II.
YES
OPEN CB2 AND SET BATT/EXT PWR SWITCH TO OFF.
CHECK FOR OPEN BETWEEN:
CB2-1 AND CB15-1
CB2-2 AND A77J2-11
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB2-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-11.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB2-2 AND A77J2-11.
GO TO PARA 9-24-1
NO
REPLACE CIRCUIT BREAKER CB2.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-24-1.

END OF TASK

9-24-10. MUX L PYL INBD CIRCUIT BREAKER (CB1) - DOES NOT STAY CLOSED OR CONTINUITY TO PYLON MRTU TYPE II DOES NOT EXIST BETWEEN J4-A AND J2-9

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

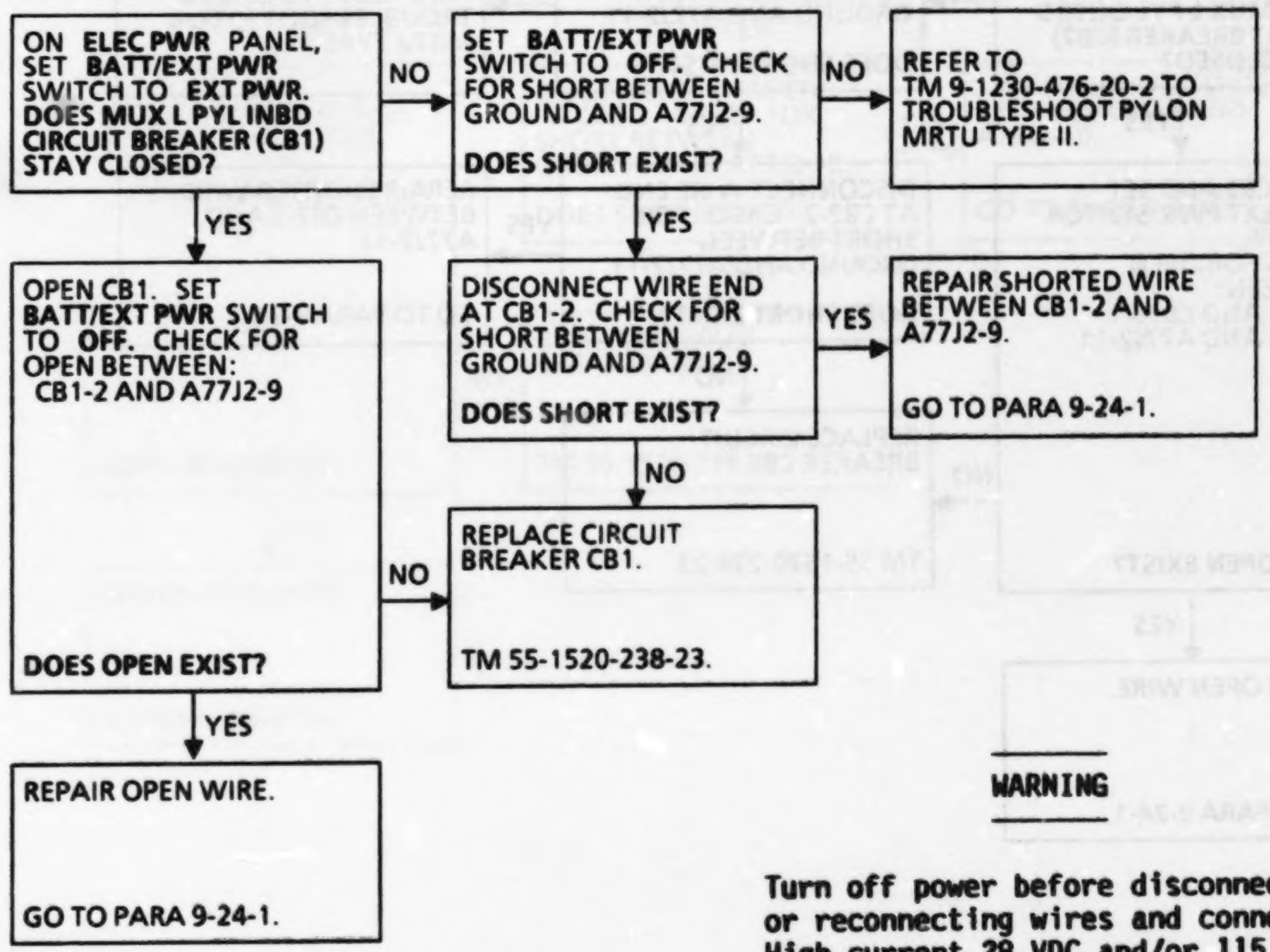
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX L PYL INBD CIRCUIT BREAKER (CB1) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-9. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT PYLON MRTU TYPE II.
YES
OPEN CB1. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB1-2 AND A77J2-9 DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB1-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-9. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB1-2 AND A77J2-9. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB1. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-24-11. MUX R PYL INBD CIRCUIT BREAKER (CB45) - DOES NOT STAY CLOSED OR CONTINUITY TO PYLON MRTU TYPE II DOES NOT EXIST BETWEEN J4-A AND J2-8

Tools: (para 9-24-10)

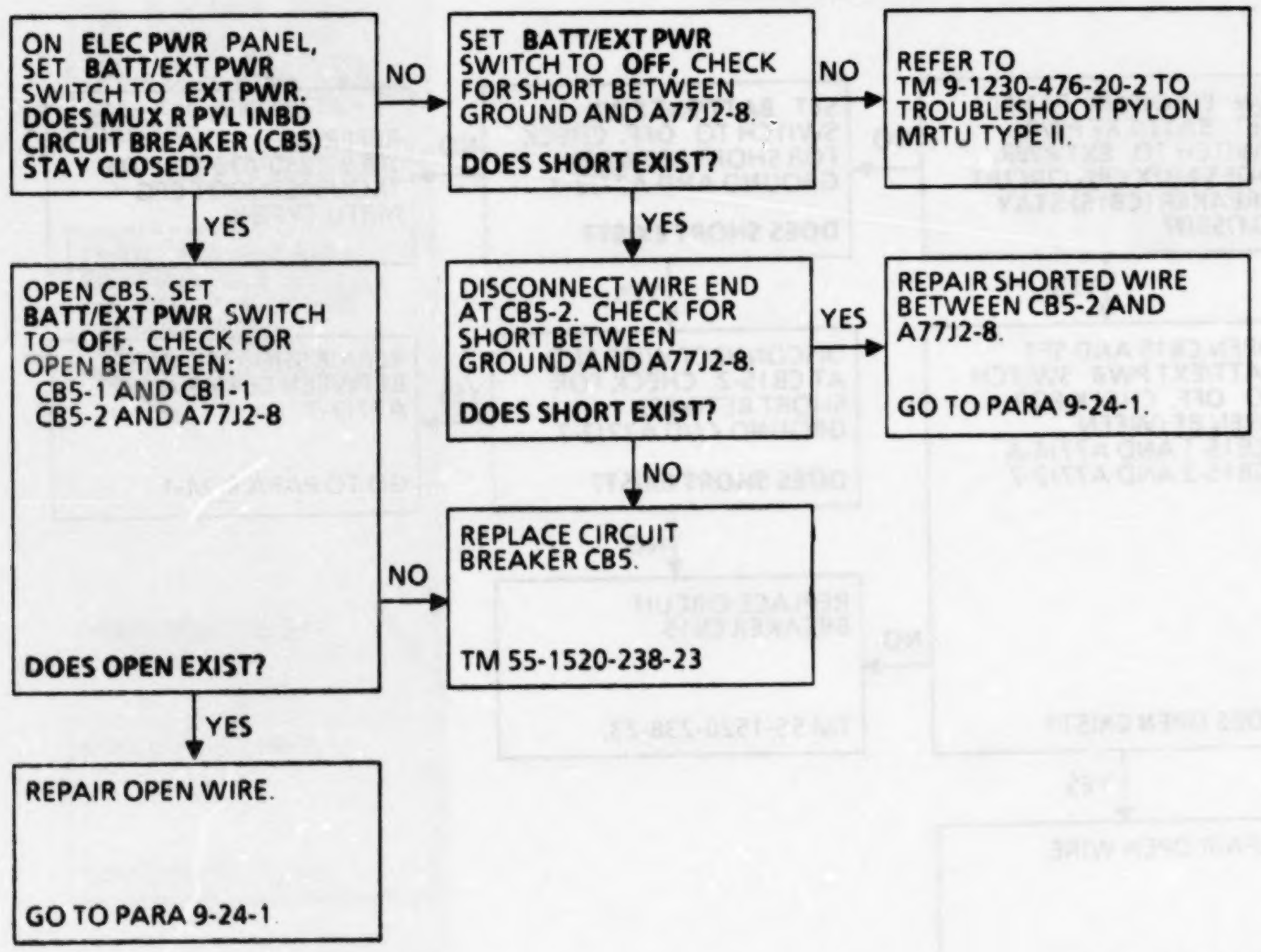
Personnel Required: (para 9-24-10)

References: (para 9-24-10)

Equipment Conditions: (para 9-24-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX R PYL INBD CIRCUIT BREAKER (CB5) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND A77J2-8. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT PYLON MRTU TYPE II.
YES
OPEN CB5. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB5-1 AND CB1-1 CB5-2 AND A77J2-8 DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB5-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-8. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB5-2 AND A77J2-8. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB5. TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1

END OF TASK

9-24-12. MUX R PYL OUTBD CIRCUIT BREAKER (CB6) - DOES NOT STAY CLOSED OR CONTINUITY TO PYLON MRTU TYPE II DOES NOT EXIST BETWEEN J4-A AND J2-10

Tools: (para 9-24-10)

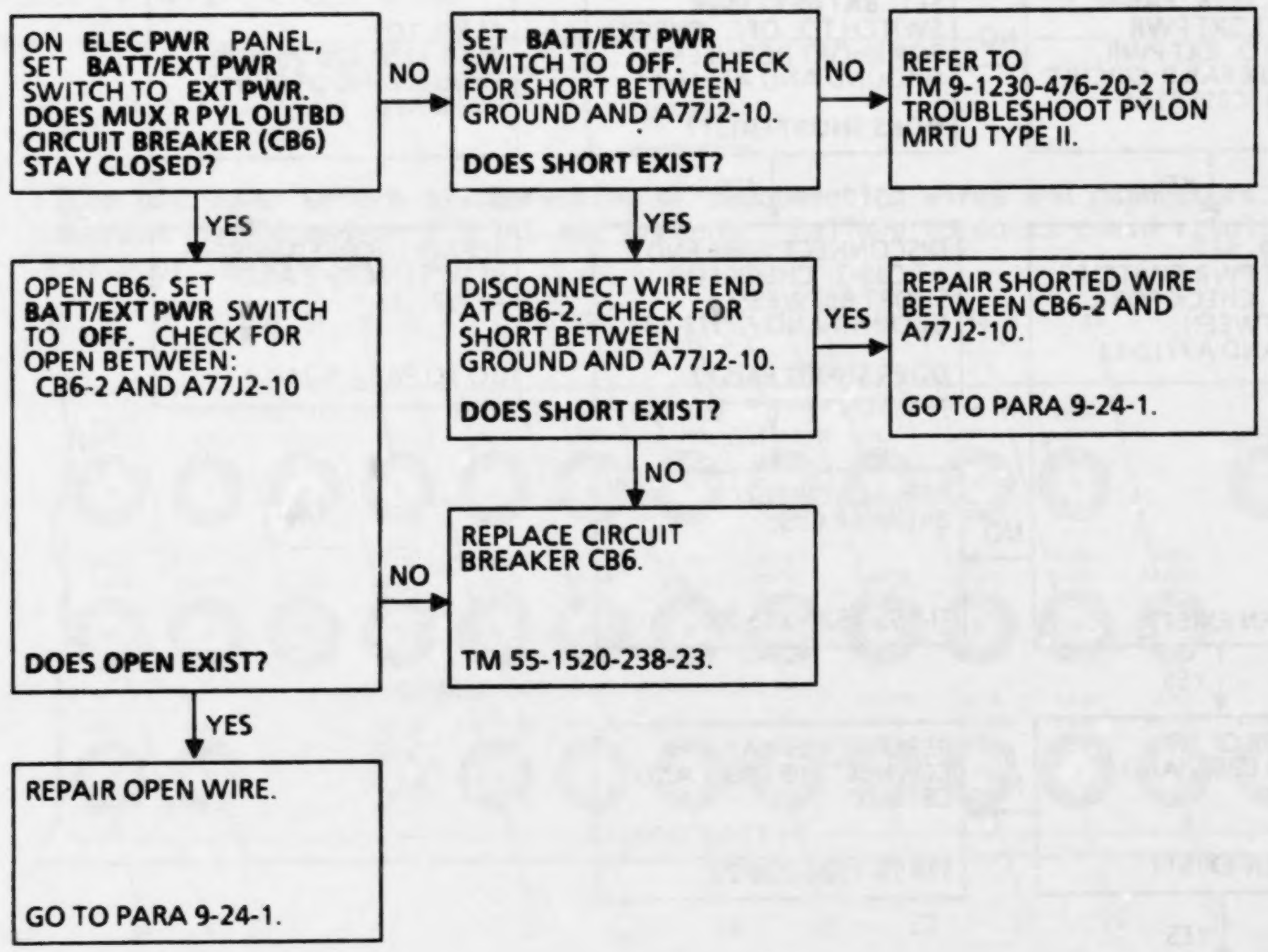
Personnel Required: (para 9-24-10)

References: (para 9-24-10)

Equipment Conditions: (para 9-24-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX R PYL OUTBD CIRCUIT BREAKER (CB6) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-10. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT PYLON MRTU TYPE II.
YES
YES
OPEN CB6. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB6-2 AND A77J2-10 DOES OPEN EXIST?
DISCONNECT WIRE END AT CB6-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-10. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB6-2 AND A77J2-10. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB6. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

END OF TASK

9-24-13. MUX FAB L CIRCUIT BREAKER (CB10) - DOES NOT STAY CLOSED OR CONTINUITY TO LEFT FAB MRTU TYPE I DOES NOT EXIST BETWEEN J4-A AND J2-14

Tools: (para 9-24-10)

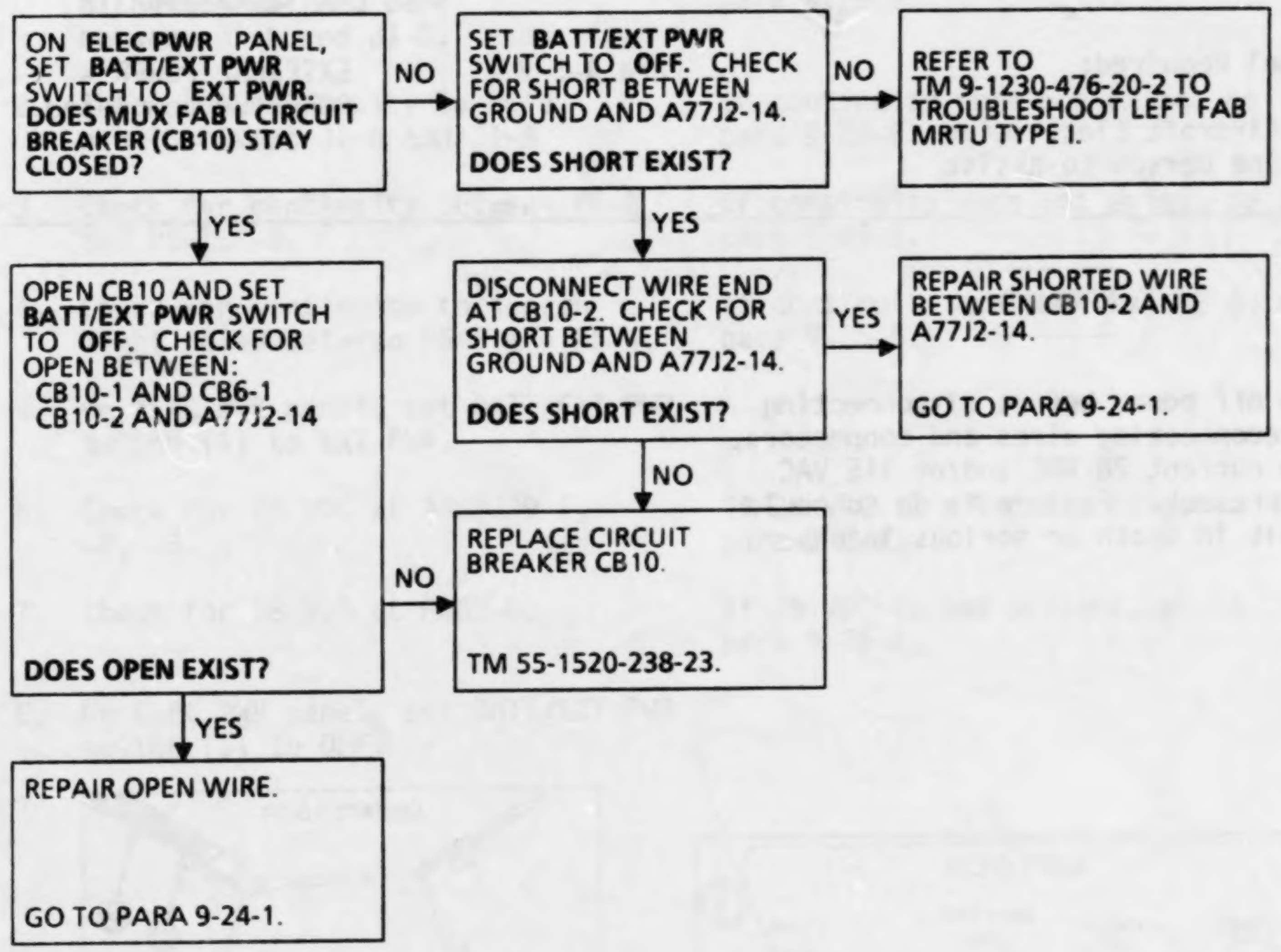
Personnel Required: (para 9-24-10)

References: (para 9-24-10)

Equipment Conditions: (para 9-24-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX FAB L CIRCUIT BREAKER (CB10) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-14. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT LEFT FAB MRTU TYPE I.
YES
YES
OPEN CB10 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB10-1 AND CB6-1 CB10-2 AND A77J2-14 DOES OPEN EXIST?
DISCONNECT WIRE END AT CB10-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-14. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB10-2 AND A77J2-14. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB10. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

END OF TASK

9-24-14. MUX FAB R CIRCUIT BREAKER (CB9) - DOES NOT STAY CLOSED OR CONTINUITY TO RIGHT FAB MRTU TYPE I DOES NOT EXIST BETWEEN J4-A AND J2-13

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

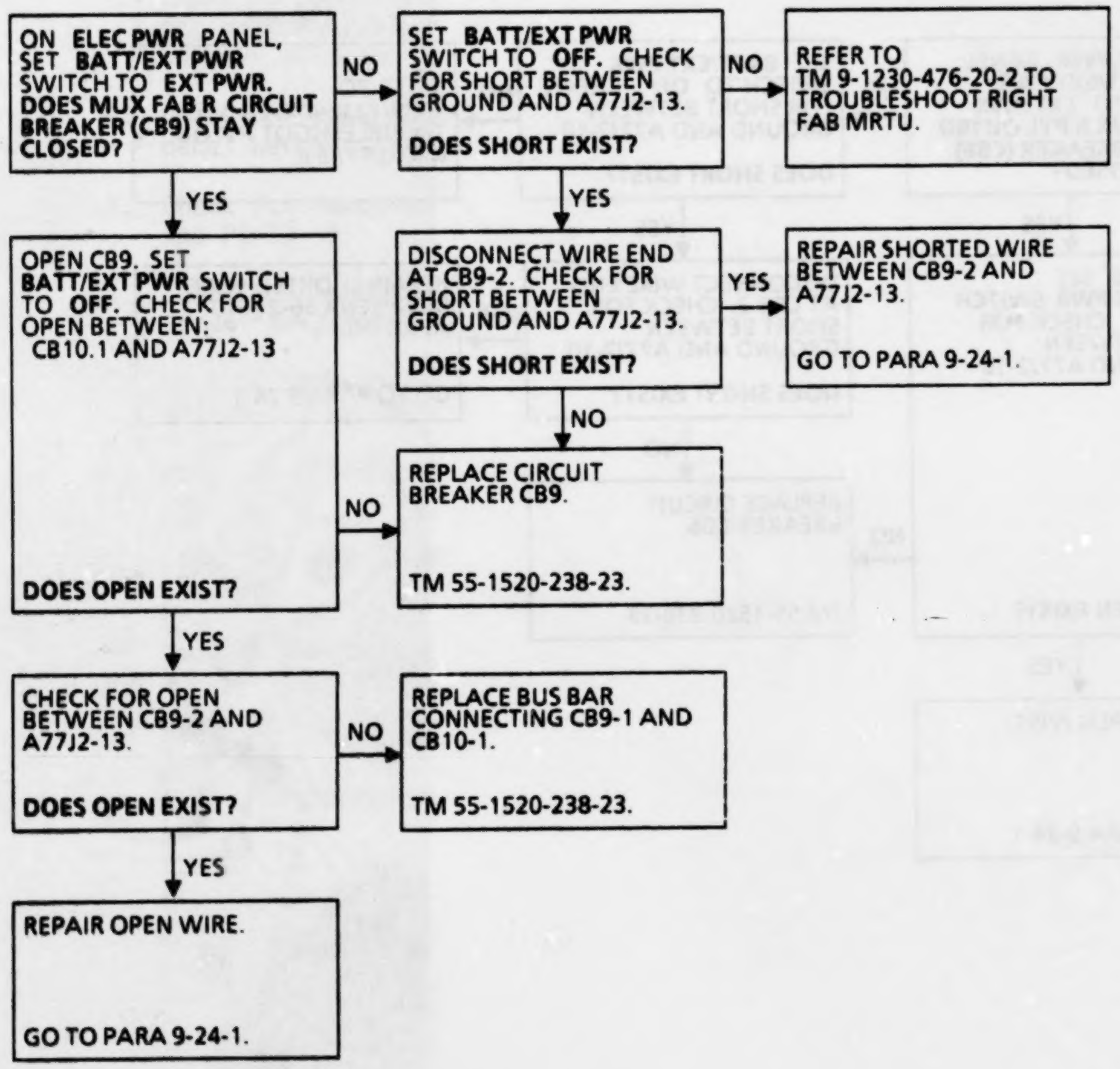
TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	CPG circuit breaker no. 1 removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX FAB R CIRCUIT BREAKER (CB9) STAY CLOSED?

SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-13. DOES SHORT EXIST?

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT RIGHT FAB MRTU.

OPEN CB9. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB10.1 AND A77J2-13 DOES OPEN EXIST?

DISCONNECT WIRE END AT CB9-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-13. DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB9-2 AND A77J2-13. GO TO PARA 9-24-1.

REPLACE CIRCUIT BREAKER CB9. TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN CB9-2 AND A77J2-13. DOES OPEN EXIST?

REPLACE BUS BAR CONNECTING CB9-1 AND CB10-1. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-24-1.

END OF TASK

9-25-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

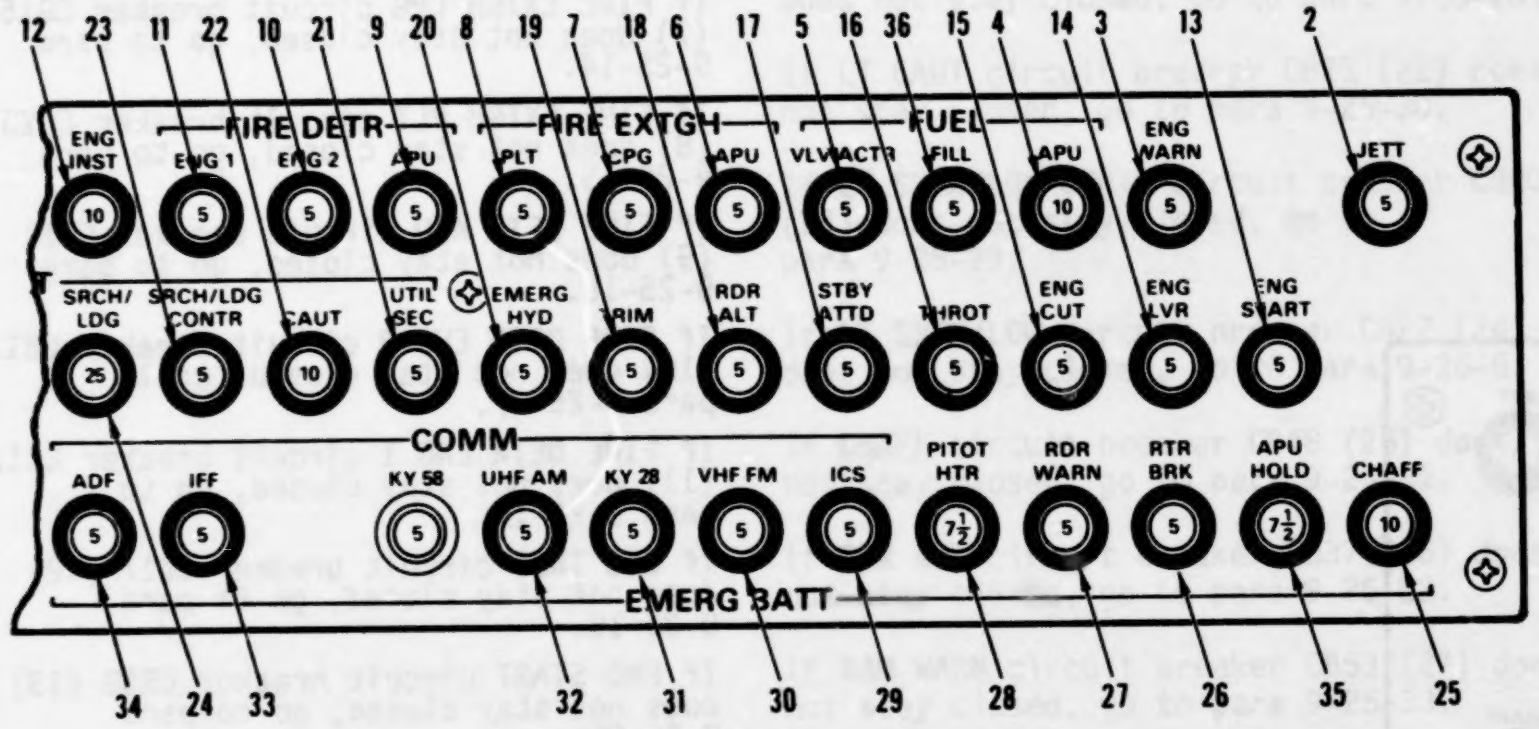
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


12
23
11
22
10
21
9
20
8
19
7
18
6
17
5
16
36
15
4
14
3
13
2
FIRE DETR
FIRE EXTGH
FUEL
ENG INST
ENG 1
ENG 2
APU
PLT
CPG
APU
VLV ACTR
FILL
APU
ENG WARN
JETT
SRCH/ LDG
SRCH/LDG CONTR
CAUT
UTIL SEC
EMERG HYD
TRIM
RDR ALT
STBY ATTD
THROT
ENG CUT
ENG LVR
ENG START
COMM
ADF
IFF
KY 58
UHF AM
KY 28
VHF FM
ICS
PITOT HTR
RDR WARN
RTR BRK
APU HOLD
CHAFF
EMERG BATT
10
5
5
5
5
5
5
5
5
10
5
5
25
5
10
5
5
5
5
5
5
5
5
5
5
5
5
5
5
5
5
7½
5
5
7½
10
34
24
33
32
31
30
29
28
27
26
35
25

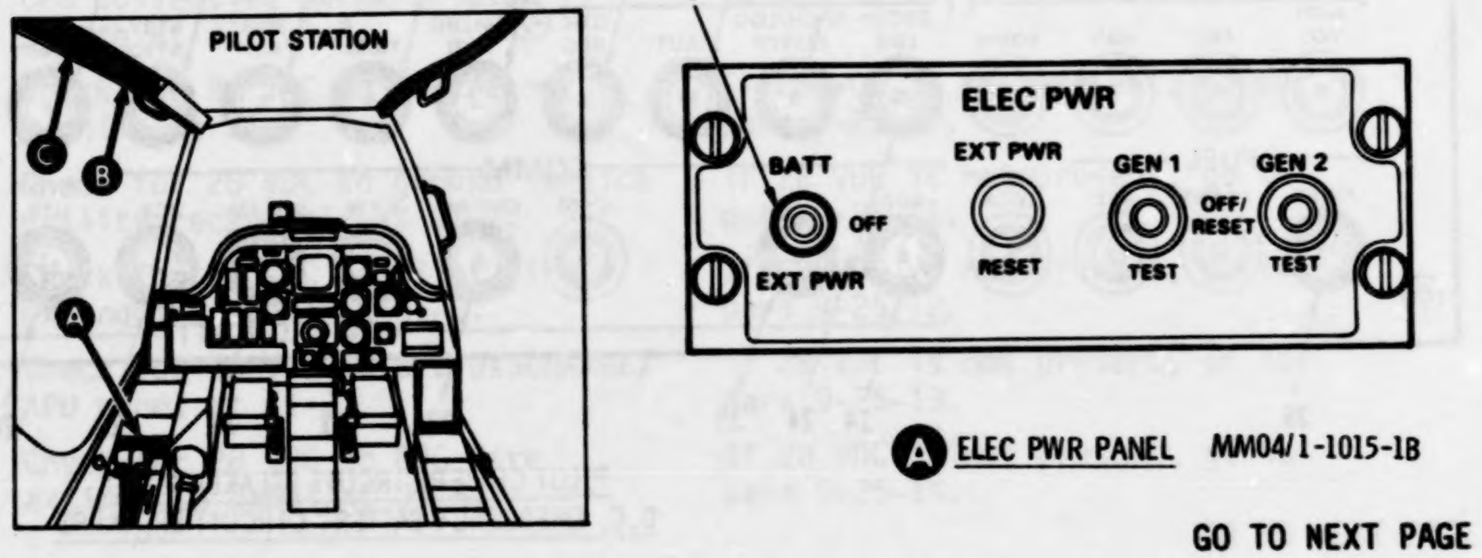
Ⓑ PILOT CENTER CIRCUIT BREAKER PANEL
D.C. EMERGENCY BATTERY CIRCUIT BREAKER

A. In aft avionics bay, check that CB148 is closed and battery is connected.

B. Disconnect A76P1, A76P5 and P463.

C. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P5-1.	If short exists, go to para 9-25-4.
1.1 Check for continuity to BTL DISCHARGE/APU panel between J1-h and J1-B.	If continuity does not exist, go to para 9-25-7.
2. Check for continuity to refuel panel between J1-h and J1-A.	If continuity does not exist, go to para 9-25-8.
3. Check for continuity between P5-2 and P5-1, -3.	If continuity does not exist, go to para 9-25-5.
4. Check for continuity to search light relay between P5-2 and P5-4.	If continuity does not exist, go to para 9-25-6.
5. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
6. Check for 28 VDC at A402J29-1, -2, -3.	If 28 VDC is not present, go to para 9-3-1.
7. Check for 28 VDC at P463-h.	If 28 VDC is not present, go to para 9-25-7.
8. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.	


PILOT STATION
C
B
A
1
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
OFF/ RESET
TEST
GEN 2
TEST

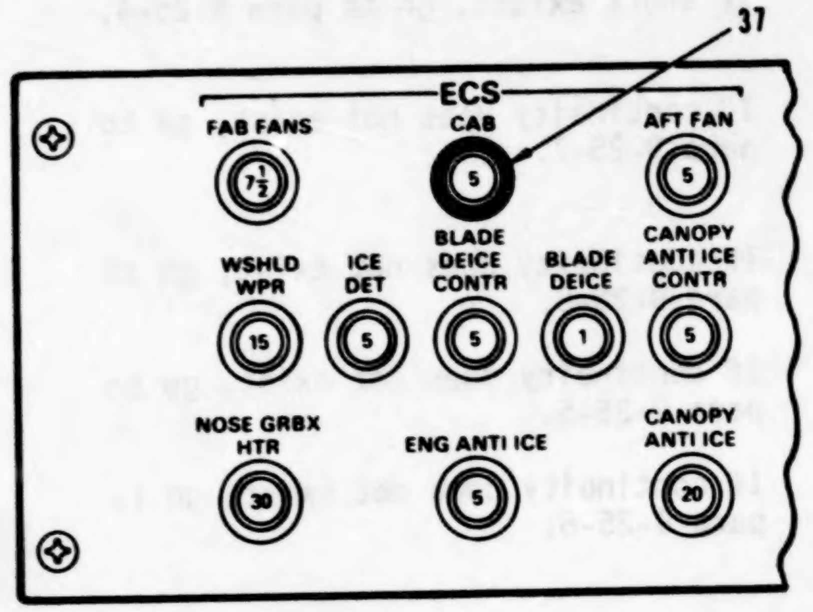
Ⓐ ELEC PWR PANEL MM04/1-1015-1B

GO TO NEXT PAGE

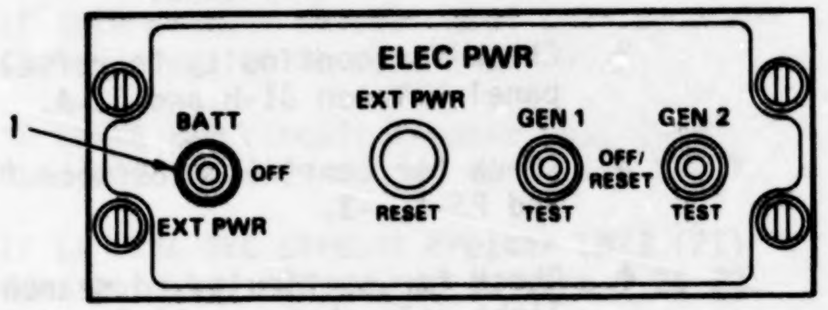
9-25-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - OPERATIONAL CHECK (cont)

WARNING

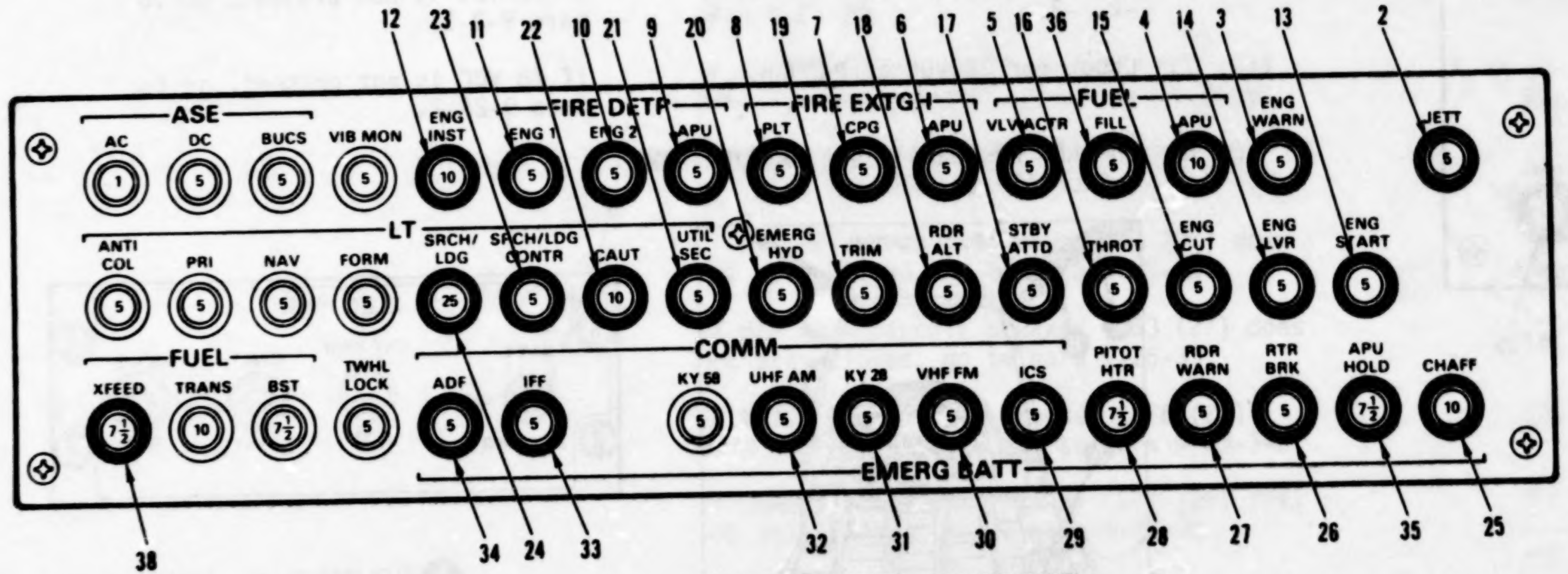
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


37
ECS
FAB FANS
CAB
AFT FAN
WSHLD WPR
ICE DET
BLADE DEICE CONTR
BLADE DEICE
CANOPY ANTI ICE CONTR
NOSE GRBX HTR
ENG ANTI ICE
CANOPY ANTI ICE
7½
5
5
15
5
5
1
5
30
5
20

PILOT AFT CIRCUIT BREAKER PANEL


1
ELEC PWR
BATT
OFF
EXT PWR
EXT PWR
RESET
GEN 1
GEN 2
OFF/RESET
TEST
TEST

ELEC PWR PANEL


12
23
11
22
10
21
9
20
8
19
7
18
6
17
5
16
36
15
4
14
3
13
2
ASE
AC
DC
BUCS
VIB MON
ENG INST
FIRE DETR
ENG 1
ENG 2
APU
FIRE EXTGH
PLT
CPG
APU
FUEL
VLV ACTR
FILL
APU
ENG WARN
JETT
LT
ANTI COL
PRI
NAV
FORM
SRCH/LDG
SRCH/LDG CONTR
CAUT
UTIL SEC
EMERG HYD
TRIM
RDR ALT
STBY ATTD
THROT
ENG CUT
ENG LVR
ENG START
FUEL
XFEED
TRANS
BST
TWHL LOCK
ADF
IFF
COMM
KY 58
UHF AM
KY 28
VHF FM
ICS
PITOT HTR
RDR WARN
RTR BRK
APU HOLD
CHAFF
EMERG BATT
38
34
24
33
32
31
30
29
28
27
26
35
25

PILOT CENTER CIRCUIT BREAKER PANEL
D.C. EMERGENCY BATTERY CIRCUIT BREAKERS

MM04/1-1015-2C

TASK	RESULT
9. Reconnect A76P1, A76P5 and P463. Check that all pilot emergency battery circuit breakers are closed.	
10. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
11. Check that all pilot emergency battery circuit breakers remain closed.	If **JETT** circuit breaker CB34 (2) does not stay closed, go to para 9-25-9. If **ENG WARN** circuit breaker CB52 (3) does not stay closed, go to para 9-25-10. If **FUEL APU** circuit breaker CB9 (4) does not stay closed, go to para 9-25-11. If **FUEL VLV ACTR** circuit breaker CB14 (5) does not stay closed, go to para 9-25-12. If **FIRE EXTGH APU** circuit breaker CB26 (6) does not stay closed, go to para 9-25-13. If **FIRE EXTGH CPG** circuit breaker CB15 (7) does not stay closed, go to para 9-25-14. If **FIRE EXTGH PLT** circuit breaker CB25 (8) does not stay closed, go to para 9-25-15. If **FIRE DETR APU** circuit breaker CB11 (9) does not stay closed, go to para 9-25-16. If **FIRE DETR ENG 2** circuit breaker CB13 (10) does not stay closed, go to para 9-25-17. If **FIRE DETR ENG 1** circuit breaker CB12 (11) does not stay closed, go to para 9-25-18. If **ENG INST** circuit breaker CB17 (12) does not stay closed, go to para 9-25-19. If **ENG START** circuit breaker CB58 (13) does not stay closed, go to para 9-25-20. If **ENG LVR** circuit breaker CB16 (14) does not stay closed, go to para 9-25-21. If **FUEL XFEED** circuit breaker CB55 (38) does not stay closed, go to para 9-25-42.

GO TO NEXT PAGE

9-25-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - OPERATIONAL CHECK (cont)

TASK	RESULT
	If **ENG CUT** circuit breaker CB60 (15) does not stay closed, go to para 9-25-22.
	If **THROT** circuit breaker CB8 (16) does not stay closed, go to para 9-25-23.
	If **STBY ATTD** circuit breaker CB19 (17) does not stay closed, go to para 9-25-24.
	If **RDR ALT** circuit breaker CB31 (18) does not stay closed, go to para 9-25-25.
	If **TRIM** circuit breaker CB87 (19) does not stay closed, go to para 9-25-26.
	If **EMERG HYD** circuit breaker CB35 (20) does not stay closed, go to para 9-25-27.
	If **LT UTIL SEC** circuit breaker CB23 (21) does not stay closed, go to para 9-25-28.
	If **LT CAUT** circuit breaker CB21 (22) does not stay closed, go to para 9-25-30.
	If **LT SRCH/LDG CONTR** circuit breaker CB80 (23) does not stay closed, go to para 9-25-29.
	If **LT SRCH/LDG** circuit breaker CB22 (24) does not stay closed, go to para 9-25-6.
	If **CHAFF** circuit breaker CB48 (25) does not stay closed, go to para 9-25-31.
	If **RTR BRK** circuit breaker CB37 (26) does not stay closed, go to para 9-25-32.
	If **RAD WARN** circuit breaker CB53 (27) does not stay closed, go to para 9-25-33.
	If **PITOT HTR** circuit breaker CB36 (28) does not stay closed, go to para 9-25-34.
	If **COMM ICS** circuit breaker CB27 (29) does not stay closed, go to para 9-25-35.

TASK	RESULT
	If **COMM VHF AM** circuit breaker CB64 (30) does not stay closed, go to para 9-25-36.
	If **COMM KY-28** circuit breaker CB30 (31) does not stay closed, go to para 9-25-37.
	If **COMM UHF AM** circuit breaker CB24 (32) does not stay closed, go to para 9-25-38.
	If **COMM IFF** circuit breaker CB29 (33) does not stay closed, go to para 9-25-39.
	If **COMM ADF** circuit breaker CB65 (34) does not stay closed, go to para 9-25-40.
	If **APU HOLD** circuit breaker CB10 (35) does not stay closed, go to para 9-25-7.
	If **FUEL FILL** circuit breaker CB32 (36) does not stay closed, go to para 9-25-8.
	If **ECS CAB** circuit breaker CB76 (37) does not stay closed, go to para 9-25-41.
12. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and disconnect P463.	
13. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
14. Check for 28 VDC to pilot and CPG collective stick **ST JTSN** switch at J1-P, -R.	If 28 VDC is not present, go to para 9-25-9.
15. Check for 28 VDC to engine out warning at J1-N.	If 28 VDC is not present, go to para 9-25-10.
16. Check for 28 VDC to ground service utility receptacle at J1-z.	If 28 VDC is not present, go to para 9-25-11.
17. Check for 28 VDC to pilot fire extinguish panel at J1-C.	If 28 VDC is not present, go to para 9-25-12.
18. Check for 28 VDC to **BTL DISCHARGE/APU** panel at J1-J.	If 28 VDC is not present, go to para 9-25-13.
19. Check for 28 VDC to CPG fire extinguish panel at J1-H.	If 28 VDC is not present, go to para 9-25-14.

GO TO NEXT PAGE

9-25-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - OPERATIONAL CHECK (cont)

TASK	RESULT
20. Check for 28 VDC to pilot fire extinguish panel at J1-D.	If 28 VDC is not present, go to para 9-25-15.
21. Check for 28 VDC to APU flame detector at J1-E.	If 28 VDC is not present, go to para 9-25-16.
22. Check for 28 VDC to engine 2 flame detector at J1-G.	If 28 VDC is not present, go to para 9-25-17.
23. Check for 28 VDC to engine 1 flame detector at J1-F.	If 28 VDC is not present, go to para 9-25-18.
24. Check for 28 VDC to signal data converter at J1-L and M.	If 28 VDC is not present, go to para 9-25-19.
25. Check for 28 VDC to pilot power quadrant at J1-c and x.	If 28 VDC is not present, go to para 9-25-20.
26. Check for 28 VDC to pilot fire extinguish panel at J1-K.	If 28 VDC is not present, go to para 9-25-21.
27. Check for 28 VDC to pilot and CPG collective sticks at J1-b.	If 28 VDC is not present, go to para 9-25-22.
28. Check for 28 VDC to CPG power quadrant panel at J1-d.	If 28 VDC is not present, go to para 9-25-23.
29. Check for 28 VDC to standby attitude indicator at J1-e.	If 28 VDC is not present, go to para 9-25-24.
30. Check for 28 VDC to radar altimeter receiver transmitter at J1-f and g.	If 28 VDC is not present, go to para 9-25-25.
31. Check for 28 VDC to pilot and CPG cyclic sticks at J1-Y and Z.	If 28 VDC is not present, go to para 9-25-26.
32. Check for 28 VDC to primary and utility manifolds at J1-k and m.	If 28 VDC is not present, go to para 9-25-27.
33. Check for 28 VDC to utility lights at J1-U and W.	If 28 VDC is not present, go to para 9-25-28.
34. Check for 28 VDC to pilot and CPG collective sticks - search light control at J1-V.	If 28 VDC is not present, go to para 9-25-29.
35. Check for 28 VDC to pilot master and caution/warning panels at J1-y.	If 28 VDC is not present, go to para 9-25-30.
36. Check for 28 VDC to chaff dispense control panel at J1-t.	If 28 VDC is not present, go to para 9-25-31.
37. Check for 28 VDC to rotor brake pressure switch at J1-n.	If 28 VDC is not present, go to para 9-25-32.
38. Check for 28 VDC to control detecting set at J1-q.	If 28 VDC is not present, go to para 9-25-33.
39. Check for 28 VDC to pilot ANTI-ICE panel at J1-s.	If 28 VDC is not present, go to para 9-25-34.
40. Check for 28 VDC to audio junction unit at J1-a.	If 28 VDC is not present, go to para 9-25-35.
41. Check for 28 VDC to phase front homing module at J1-w.	If 28 VDC is not present, go to para 9-25-36.
42. Check for 28 VDC to secure voice control panel at J1-p.	If 28 VDC is not present, go to para 9-25-37.
43. Check for 28 VDC to UHF-AM radio control panel at J1-v.	If 28 VDC is not present, go to para 9-25-38.
44. Check for 28 VDC to IFF receiver transmitter at J1-S.	If 28 VDC is not present, go to para 9-25-39.
45. Check for 28 VDC to direction finder receiver at J1-r.	If 28 VDC is not present, go to para 9-25-40.
46. Check for 28 VDC to AUX/ANTI-ICE panel P1-2.	If 28 VDC is not present, go to para 9-25-41.
47. Check for 28 VDC to engine 1 and 2 fuel valve actuators at P1-32.	If 28 VDC is not present, go to para 9-25-42.

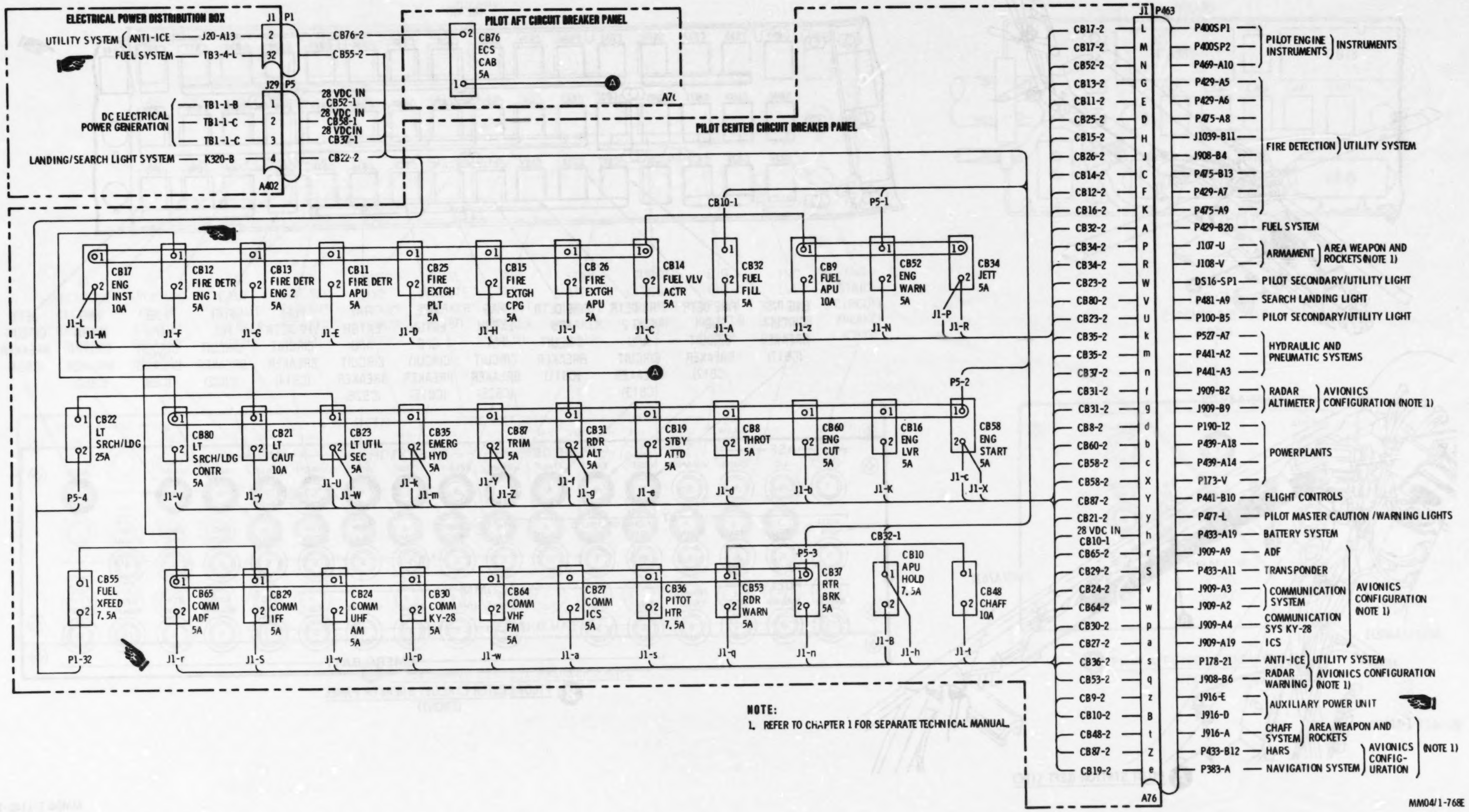
D. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.

E. Reconnect P463.

F. Remove external power - Electrical (TM 55-1520-238-23).

END OF TASK

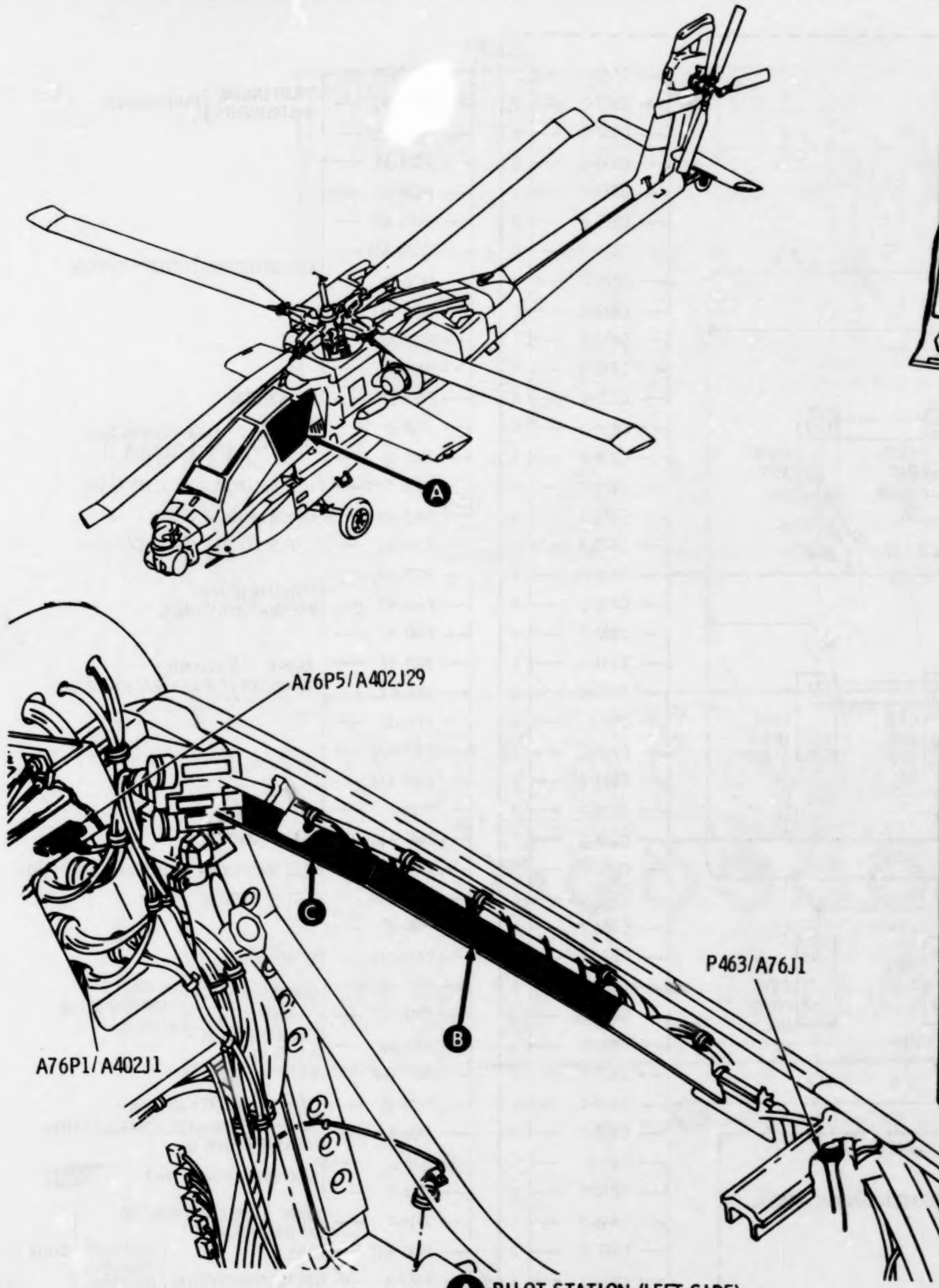
9-25-2. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - INTERCONNECT DIAGRAM


ELECTRICAL POWER DISTRIBUTION BOX
UTILITY SYSTEM
ANTI-ICE — J20-A13 — 2 — CB76-2
FUEL SYSTEM — TB3-4-L — 32 — CB55-2
J1
P1
J29
P5
DC ELECTRICAL POWER GENERATION
TB1-1-B — 1 — 28 VDC IN CB52-1
TB1-1-C — 2 — 28 VDC IN CB58-1
TB1-1-C — 3 — 28 VDCIN CB37-1
LANDING/SEARCH LIGHT SYSTEM — K320-B — 4 — CB22-2
A402
PILOT AFT CIRCUIT BREAKER PANEL
CB76 ECS CAB 5A
A
A76
PILOT CENTER CIRCUIT BREAKER PANEL
CB10-1
P5-1
CB17 ENG INST 10A
CB12 FIRE DETR ENG 1 5A
CB13 FIRE DETR ENG 2 5A
CB11 FIRE DETR APU 5A
CB25 FIRE EXTGH PLT 5A
CB15 FIRE EXTGH CPG 5A
CB 26 FIRE EXTGH APU 5A
CB14 FUEL VLV ACTR 5A
CB32 FUEL FILL 5A
CB9 FUEL APU 10A
CB52 ENG WARN 5A
CB34 JETT 5A
J1-L
J1-M
J1-F
J1-G
J1-E
J1-D
J1-H
J1-J
J1-C
J1-A
J1-z
J1-N
J1-P
J1-R
P5-2
CB22 LT SRCH/LDG 25A
CB80 LT SRCH/LDG CONTR 5A
CB21 LT CAUT 10A
CB23 LT UTIL SEC 5A
CB35 EMERG HYD 5A
CB87 TRIM 5A
CB31 RDR ALT 5A
CB19 STBY ATTD 5A
CB8 THROT 5A
CB60 ENG CUT 5A
CB16 ENG LVR 5A
CB58 ENG START 5A
P5-4
J1-V
J1-y
J1-U
J1-W
J1-k
J1-m
J1-Y
J1-Z
J1-f
J1-g
J1-e
J1-d
J1-b
J1-K
J1-c
J1-X
CB32-1
P5-3
CB55 FUEL XFEED 7.5A
CB65 COMM ADF 5A
CB29 COMM IFF 5A
CB24 COMM UHF AM 5A
CB30 COMM KY-28 5A
CB64 COMM VHF FM 5A
CB27 COMM ICS 5A
CB36 PITOT HTR 7.5A
CB53 RDR WARN 5A
CB37 RTR BRK 5A
CB10 APU HOLD 7.5A
CB48 CHAFF 10A
P1-32
J1-r
J1-S
J1-v
J1-p
J1-w
J1-a
J1-s
J1-q
J1-n
J1-B
J1-h
J1-t
J1
P463
CB17-2 — L — P400SP1
CB17-2 — M — P400SP2
CB52-2 — N — P469-A10
PILOT ENGINE INSTRUMENTS
INSTRUMENTS
CB13-2 — G — P429-A5
CB11-2 — E — P429-A6
CB25-2 — D — P475-A8
CB15-2 — H — J1039-B11
CB26-2 — J — J908-B4
CB14-2 — C — P475-B13
CB12-2 — F — P429-A7
CB16-2 — K — P475-A9
FIRE DETECTION
UTILITY SYSTEM
CB32-2 — A — P429-B20 — FUEL SYSTEM
CB34-2 — P — J107-U
CB34-2 — R — J108-V
ARMAMENT
AREA WEAPON AND ROCKETS (NOTE 1)
CB23-2 — W — DS16-SP1 — PILOT SECONDARY/UTILITY LIGHT
CB80-2 — V — P481-A9 — SEARCH LANDING LIGHT
CB23-2 — U — P100-B5 — PILOT SECONDARY/UTILITY LIGHT
CB35-2 — k — P527-A7
CB35-2 — m — P441-A2
CB37-2 — n — P441-A3
HYDRAULIC AND PNEUMATIC SYSTEMS
CB31-2 — f — J909-B2
CB31-2 — g — J909-B9
RADAR ALTIMETER
AVIONICS CONFIGURATION (NOTE 1)
CB8-2 — d — P190-12
CB60-2 — b — P439-A18
CB58-2 — c — P439-A14
CB58-2 — X — P173-V
POWERPLANTS
CB87-2 — Y — P441-B10 — FLIGHT CONTROLS
CB21-2 — y — P477-L — PILOT MASTER CAUTION /WARNING LIGHTS
28 VDC IN CB10-1 — h — P433-A19 — BATTERY SYSTEM
CB65-2 — r — J909-A9 — ADF
CB29-2 — S — P433-A11 — TRANSPONDER
CB24-2 — v — J909-A3
CB64-2 — w — J909-A2
COMMUNICATION SYSTEM
CB30-2 — p — J909-A4 — COMMUNICATION SYS KY-28
CB27-2 — a — J909-A19 — ICS
AVIONICS CONFIGURATION (NOTE 1)
CB36-2 — s — P178-21 — ANTI-ICE
UTILITY SYSTEM
CB53-2 — q — J908-B6 — RADAR WARNING
AVIONICS CONFIGURATION (NOTE 1)
CB9-2 — z — J916-E
CB10-2 — B — J916-D
AUXILIARY POWER UNIT
CB48-2 — t — J916-A — CHAFF SYSTEM
AREA WEAPON AND ROCKETS
CB87-2 — Z — P433-B12 — HARS
CB19-2 — e — P383-A — NAVIGATION SYSTEM
AVIONICS CONFIGURATION
(NOTE 1)
A76
MM04/1-768E

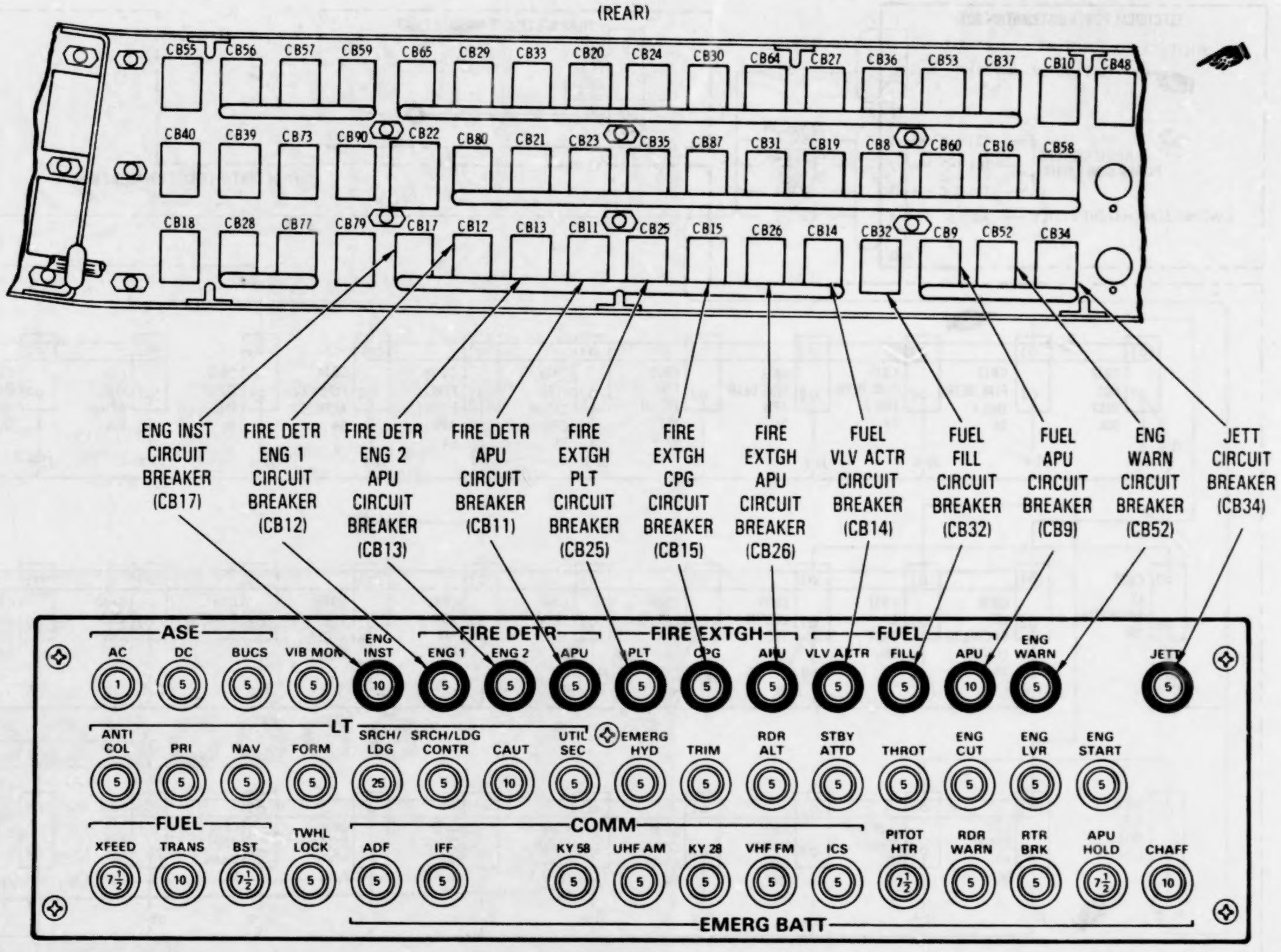
NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

9-25-3. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
A76P5/A402J29
C
B
P463/A76J1
A76P1/A402J1

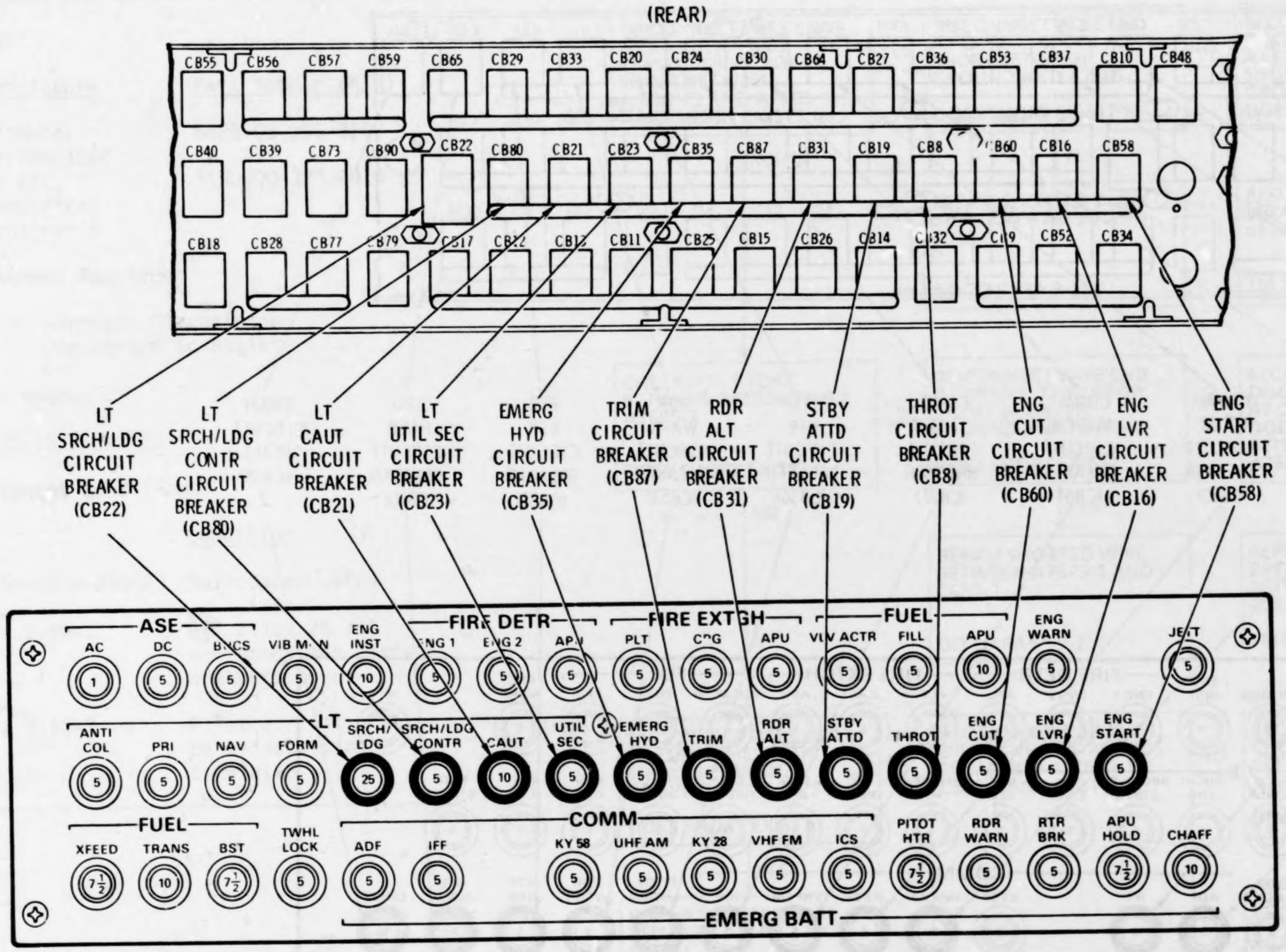
Ⓐ PILOT STATION (LEFT SIDE)


(REAR)
CB55
CB56
CB57
CB59
CB65
CB29
CB33
CB20
CB24
CB30
CB64
CB27
CB36
CB53
CB37
CB10
CB48
CB40
CB39
CB73
CB90
CB22
CB80
CB21
CB23
CB35
CB87
CB31
CB19
CB8
CB60
CB16
CB58
CB18
CB28
CB77
CB79
CB17
CB12
CB13
CB11
CB25
CB15
CB26
CB14
CB32
CB9
CB52
CB34
ENG INST CIRCUIT BREAKER (CB17)
FIRE DETR ENG 1 CIRCUIT BREAKER (CB12)
FIRE DETR ENG 2 APU CIRCUIT BREAKER (CB13)
FIRE DETR APU CIRCUIT BREAKER (CB11)
FIRE EXTGH PLT CIRCUIT BREAKER (CB25)
FIRE EXTGH CPG CIRCUIT BREAKER (CB15)
FIRE EXTGH APU CIRCUIT BREAKER (CB26)
FUEL VLV ACTR CIRCUIT BREAKER (CB14)
FUEL FILL CIRCUIT BREAKER (CB32)
FUEL APU CIRCUIT BREAKER (CB9)
ENG WARN CIRCUIT BREAKER (CB52)
JETT CIRCUIT BREAKER (CB34)
ASE
AC 1
DC 5
BUCS 5
VIB MON 5
ENG INST 10
FIRE DETR
ENG 1 5
ENG 2 5
APU 5
FIRE EXTGH
PLT 5
CPG 5
APU 5
FUEL
VLV ACTR 5
FILL 5
APU 10
ENG WARN 5
JETT 5
LT
ANTI COL 5
PRI 5
NAV 5
FORM 5
SRCH/ LDG 25
SRCH/LDG CONTR 5
CAUT 10
UTIL SEC 5
EMERG HYD 5
TRIM 5
RDR ALT 5
STBY ATTD 5
THROT 5
ENG CUT 5
ENG LVR 5
ENG START 5
FUEL
XFEED 7½
TRANS 10
BST 7½
TWHL LOCK 5
COMM
ADF 5
IFF 5
KY 58 5
UHF AM 5
KY 28 5
VHF FM 5
ICS 5
PITOT HTR 7½
RDR WARN 5
RTR BRK 5
APU HOLD 7½
CHAFF 10
EMERG BATT

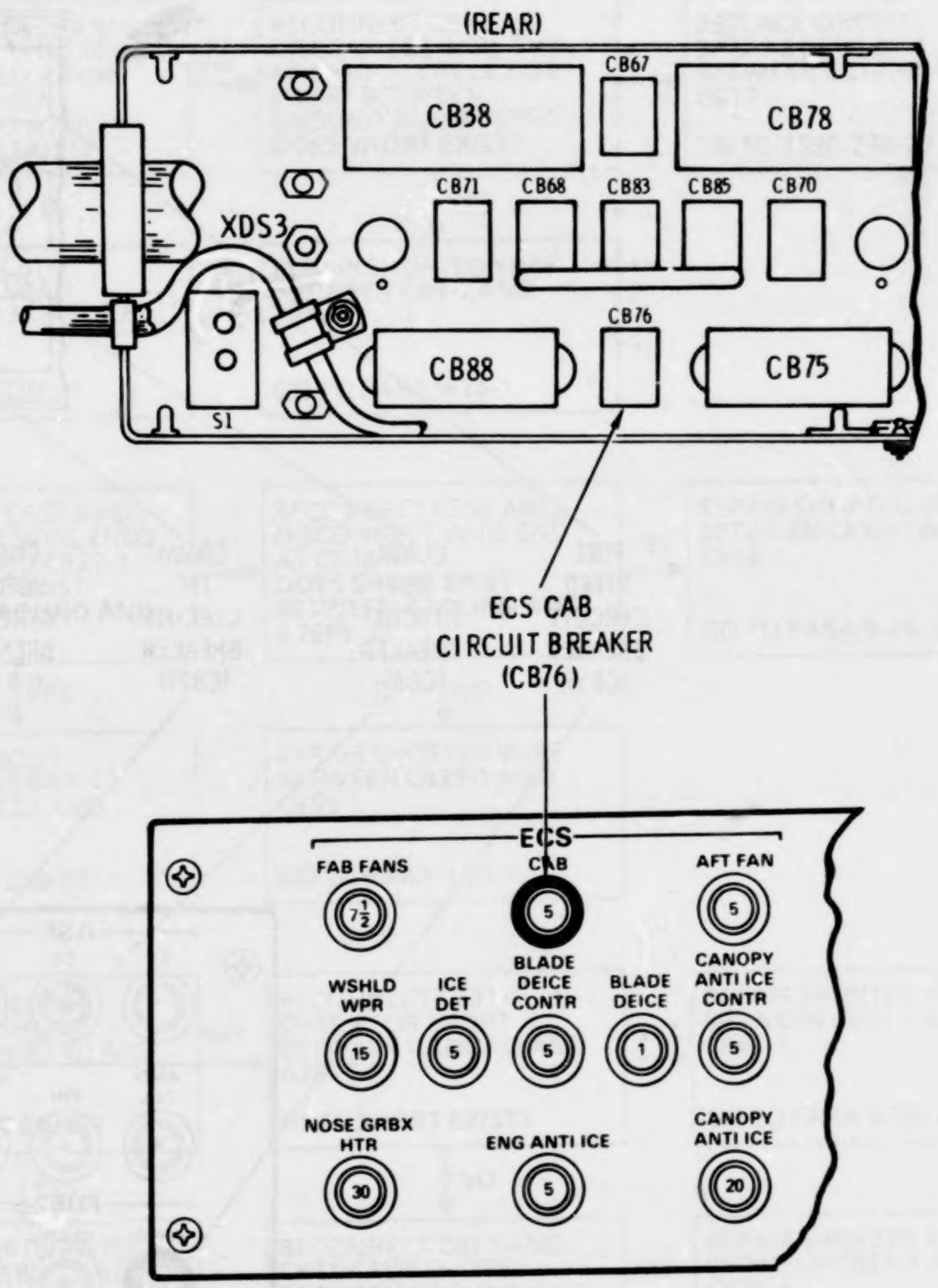
Ⓑ PILOT CENTER CIRCUIT BREAKER PANEL
(FRONT)

MM04/1-1146-1C

9-25-3. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION)-ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


(REAR)
CB55
CB56
CB57
CB59
CB65
CB29
CB33
CB20
CB24
CB30
CB64
CB27
CB36
CB53
CB37
CB10
CB48
CB40
CB39
CB73
CB90
CB22
CB80
CB21
CB23
CB35
CB87
CB31
CB19
CB8
CB60
CB16
CB58
CB18
CB28
CB77
CB79
CB17
CB12
CB13
CB11
CB25
CB15
CB26
CB14
CB32
CB9
CB52
CB34
LT SRCH/LDG CIRCUIT BREAKER (CB22)
LT SRCH/LDG CONTR CIRCUIT BREAKER (CB80)
LT CAUT CIRCUIT BREAKER (CB21)
LT UTIL SEC CIRCUIT BREAKER (CB23)
EMERG HYD CIRCUIT BREAKER (CB35)
TRIM CIRCUIT BREAKER (CB87)
RDR ALT CIRCUIT BREAKER (CB31)
STBY ATTD CIRCUIT BREAKER (CB19)
THROT CIRCUIT BREAKER (CB8)
ENG CUT CIRCUIT BREAKER (CB60)
ENG LVR CIRCUIT BREAKER (CB16)
ENG START CIRCUIT BREAKER (CB58)
ASE
AC 1
DC 5
BLCS 5
VIB MON 5
ENG INST 10
FIRE DETR
ENG 1 5
ENG 2 5
APU 5
FIRE EXTGH
PLT 5
CPG 5
APU 5
FUEL
VLV ACTR 5
FILL 5
APU 10
ENG WARN 5
JETT 5
LT
ANTI COL 5
PRI 5
NAV 5
FORM 5
SRCH/LDG 25
SRCH/LDG CONTR 5
CAUT 10
UTIL SEC 5
EMERG HYD 5
TRIM 5
RDR ALT 5
STBY ATTD 5
THROT 5
ENG CUT 5
ENG LVR 5
ENG START 5
FUEL
XFEED 7½
TRANS 10
BST 7½
TWHL LOCK 5
COMM
ADF 5
IFF 5
KY 58 5
UHF AM 5
KY 28 5
VHF FM 5
ICS 5
PITOT HTR 7½
RDR WARN 5
RTR BRK 5
APU HOLD 7½
CHAFF 10
EMERG BATT

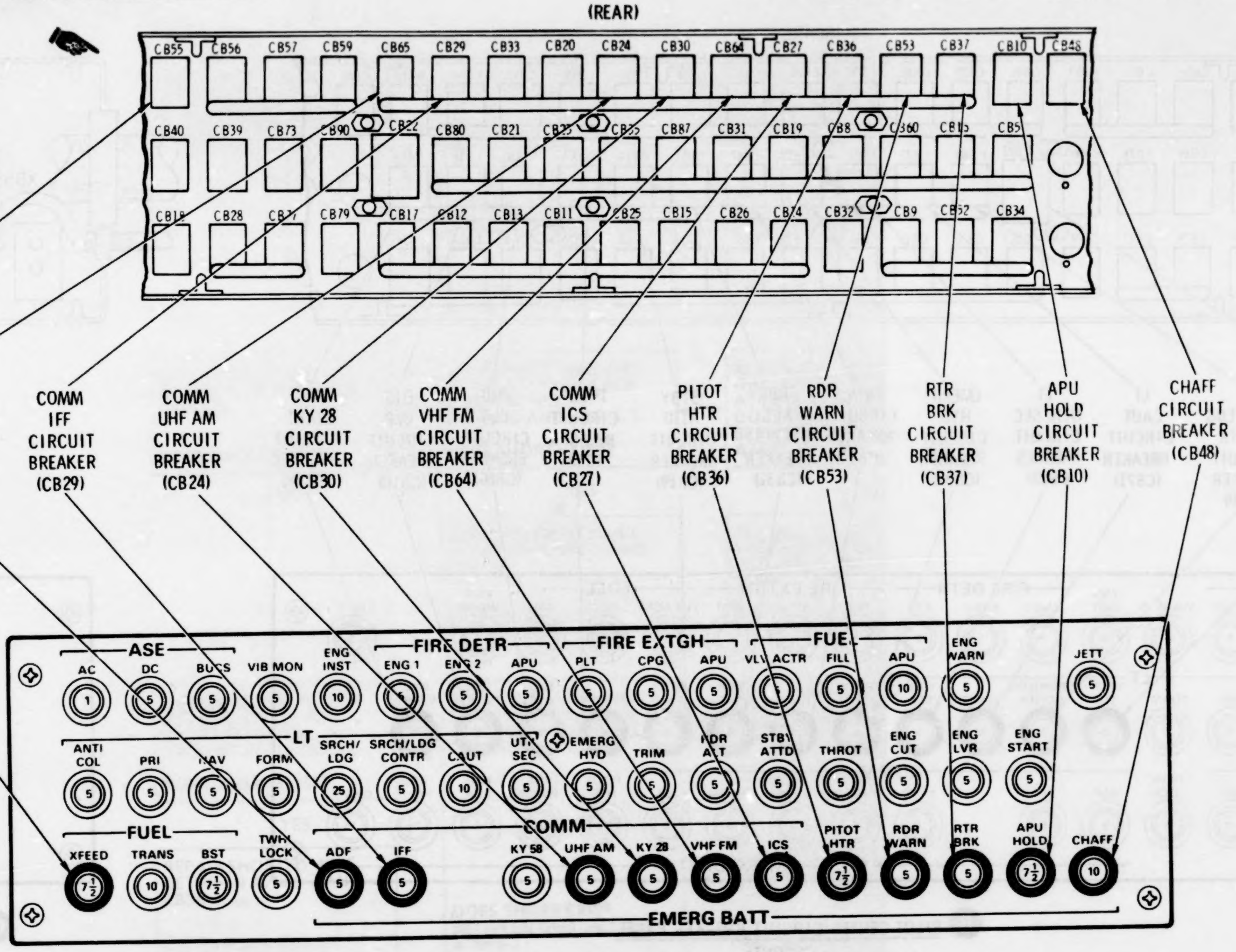
Ⓑ PILOT CENTER CIRCUIT BREAKER PANEL
(FRONT)


(REAR)
CB67
CB38
CB78
XDS3
CB71
CB68
CB83
CB85
CB70
CB76
CB88
CB75
S1
ECS CAB CIRCUIT BREAKER (CB76)
ECS
FAB FANS 7½
CAB 5
AFT FAN 5
WSHLD WPR 15
ICE DET 5
BLADE DEICE CONTR 5
BLADE DEICE 1
CANOPY ANTI ICE CONTR 5
NOSE GRBX HTR 30
ENG ANTI ICE 5
CANOPY ANTI ICE 20

Ⓒ PILOT AFT CIRCUIT BREAKER PANEL
(FRONT)

MM04/1-1146-2D

9-25-3. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


(REAR)
CB55
CB56
CB57
CB59
CB65
CB29
CB33
CB20
CB24
CB30
CB64
CB27
CB36
CB53
CB37
CB10
CB48
CB40
CB39
CB73
CB90
CB22
CB80
CB21
CB75
CB35
CB87
CB31
CB19
CB8
CB60
CB16
CB5
CB18
CB28
CB7
CB79
CB17
CB12
CB13
CB11
CB25
CB15
CB26
CB74
CB32
CB9
CB52
CB34
FUEL XFEED CIRCUIT BREAKER (CB55)
COMM ADF CIRCUIT BREAKER (CB65)
COMM IFF CIRCUIT BREAKER (CB29)
COMM UHF AM CIRCUIT BREAKER (CB24)
COMM KY 28 CIRCUIT BREAKER (CB30)
COMM VHF FM CIRCUIT BREAKER (CB64)
COMM ICS CIRCUIT BREAKER (CB27)
PITOT HTR CIRCUIT BREAKER (CB36)
RDR WARN CIRCUIT BREAKER (CB53)
RTR BRK CIRCUIT BREAKER (CB37)
APU HOLD CIRCUIT BREAKER (CB10)
CHAFF CIRCUIT BREAKER (CB48)
ASE
AC
1
DC
5
BUCS
5
VIB MON
5
ENG INST
10
FIRE DETR
ENG 1
5
ENG 2
5
APU
5
FIRE EXTGH
PLT
5
CPG
5
APU
5
FUEL
VLV ACTR
5
FILL
5
APU
10
ENG WARN
5
JETT
5
LT
ANTI COL
5
PRI
5
NAV
5
FORM
5
SRCH/ LDG
25
SRCH/LDG CONTR
5
CAUT
10
UTIL SEC
5
EMERG HYD
5
TRIM
5
RDR ALT
5
STBY ATTD
5
THROT
5
ENG CUT
5
ENG LVR
5
ENG START
5
FUEL
XFEED
7½
TRANS
10
BST
7½
TWR LOCK
5
COMM
ADF
5
IFF
5
KY 58
5
UHF AM
5
KY 28
5
VHF FM
5
ICS
5
PITOT HTR
7½
RDR WARN
5
RTR BRK
5
APU HOLD
7½
CHAFF
10
EMERG BATT

B PILOT CENTER CIRCUIT BREAKER PANEL

(FRONT)

MM04/1-1146-3B

9-25-4. SHORT EXISTS BETWEEN GROUND AND A76P5-1, -2, -3

Tools:

Nomenclature	Part Number (NSN)
Multimeter AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

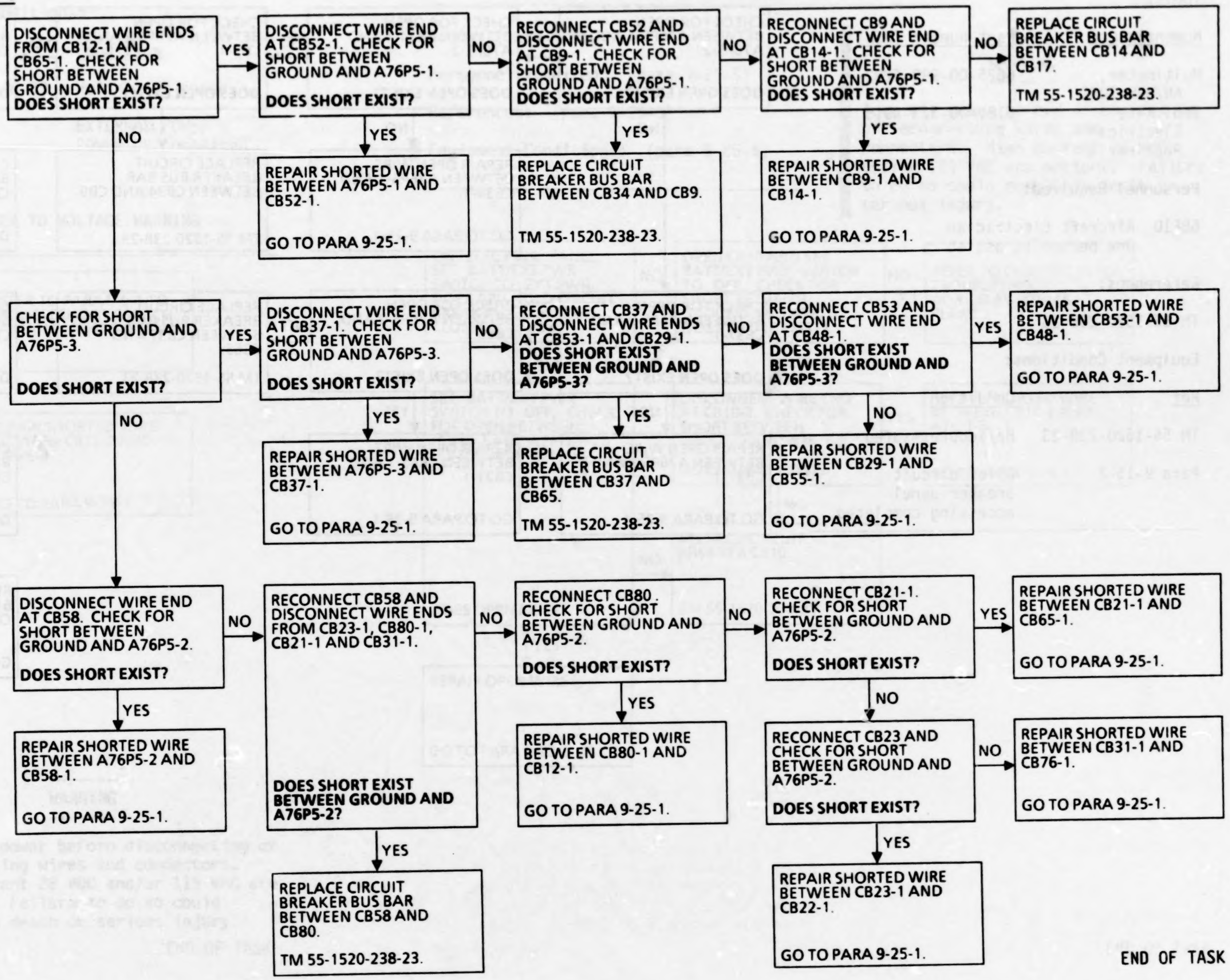
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-25-1	All pilot 28 VDC emergency bus circuit breakers open
Para 9-15-2	Pilot circuit breaker panel accessing completed


DISCONNECT WIRE ENDS FROM CB12-1 AND CB65-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-1. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB52-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-1. DOES SHORT EXIST?
NO
RECONNECT CB52 AND DISCONNECT WIRE END AT CB9-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-1. DOES SHORT EXIST?
NO
RECONNECT CB9 AND DISCONNECT WIRE END AT CB14-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-1. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB14 AND CB17. TM 55-1520-238-23.
NO
YES
REPAIR SHORTED WIRE BETWEEN A76P5-1 AND CB52-1. GO TO PARA 9-25-1.
YES
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB34 AND CB9. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN CB9-1 AND CB14-1. GO TO PARA 9-25-1.
CHECK FOR SHORT BETWEEN GROUND AND A76P5-3. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB37-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-3. DOES SHORT EXIST?
NO
RECONNECT CB37 AND DISCONNECT WIRE ENDS AT CB53-1 AND CB29-1. DOES SHORT EXIST BETWEEN GROUND AND A76P5-3?
NO
RECONNECT CB53 AND DISCONNECT WIRE END AT CB48-1. DOES SHORT EXIST BETWEEN GROUND AND A76P5-3?
YES
REPAIR SHORTED WIRE BETWEEN CB53-1 AND CB48-1. GO TO PARA 9-25-1.
NO
YES
REPAIR SHORTED WIRE BETWEEN A76P5-3 AND CB37-1. GO TO PARA 9-25-1.
YES
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB37 AND CB65. TM 55-1520-238-23.
NO
REPAIR SHORTED WIRE BETWEEN CB29-1 AND CB55-1. GO TO PARA 9-25-1.
DISCONNECT WIRE END AT CB58. CHECK FOR SHORT BETWEEN GROUND AND A76P5-2. DOES SHORT EXIST?
NO
RECONNECT CB58 AND DISCONNECT WIRE ENDS FROM CB23-1, CB80-1, CB21-1 AND CB31-1. DOES SHORT EXIST BETWEEN GROUND AND A76P5-2?
NO
RECONNECT CB80. CHECK FOR SHORT BETWEEN GROUND AND A76P5-2. DOES SHORT EXIST?
NO
RECONNECT CB21-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-2. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB21-1 AND CB65-1. GO TO PARA 9-25-1.
YES
REPAIR SHORTED WIRE BETWEEN A76P5-2 AND CB58-1. GO TO PARA 9-25-1.
YES
REPAIR SHORTED WIRE BETWEEN CB80-1 AND CB12-1. GO TO PARA 9-25-1.
NO
RECONNECT CB23 AND CHECK FOR SHORT BETWEEN GROUND AND A76P5-2. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN CB31-1 AND CB76-1. GO TO PARA 9-25-1.
YES
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB58 AND CB80. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN CB23-1 AND CB22-1. GO TO PARA 9-25-1.

END OF TASK

9-25-5. CONTINUITY - DOES NOT EXIST BETWEEN A76P5-2 AND A76P5-1, -3

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

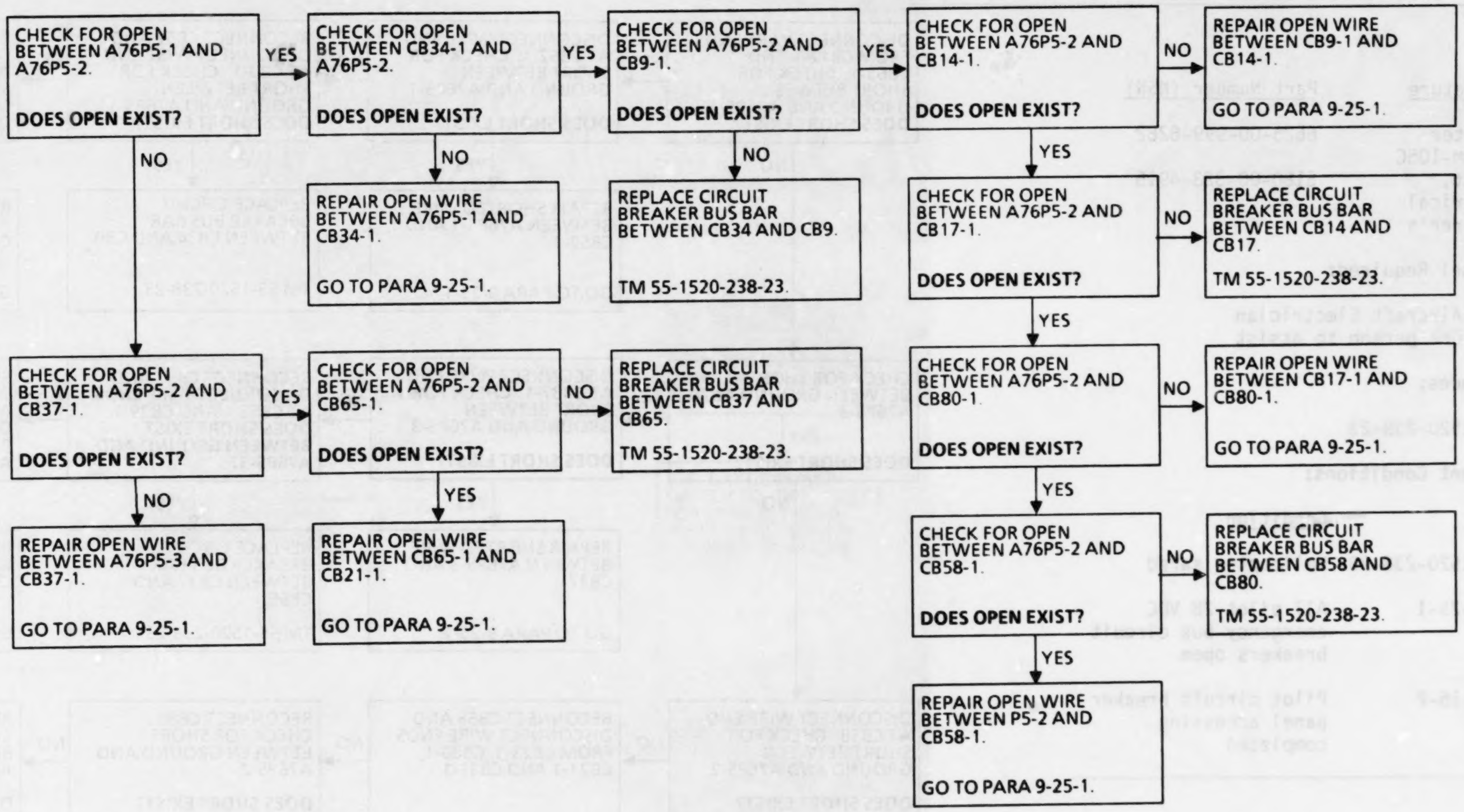
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed


CHECK FOR OPEN BETWEEN A76P5-1 AND A76P5-2. DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN CB34-1 AND A76P5-2. DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB9-1. DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB14-1. DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN CB9-1 AND CB14-1. GO TO PARA 9-25-1.
NO
REPAIR OPEN WIRE BETWEEN A76P5-1 AND CB34-1. GO TO PARA 9-25-1.
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB34 AND CB9. TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB17-1. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB14 AND CB17. TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN A76P5-2 AND CB37-1. DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB65-1. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB37 AND CB65. TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB80-1. DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN CB17-1 AND CB80-1. GO TO PARA 9-25-1.
NO
REPAIR OPEN WIRE BETWEEN A76P5-3 AND CB37-1. GO TO PARA 9-25-1.
YES
REPAIR OPEN WIRE BETWEEN CB65-1 AND CB21-1. GO TO PARA 9-25-1.
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB58-1. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB58 AND CB80. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE BETWEEN P5-2 AND CB58-1. GO TO PARA 9-25-1.

END OF TASK

9-25-6. LT SRCH/LDG CIRCUIT BREAKER (CB22) - DOES NOT STAY CLOSED OR CONTINUITY TO SEARCH LIGHT RELAY DOES NOT EXIST BETWEEN A76P5-2 AND -4

Tools: (para 9-25-5)

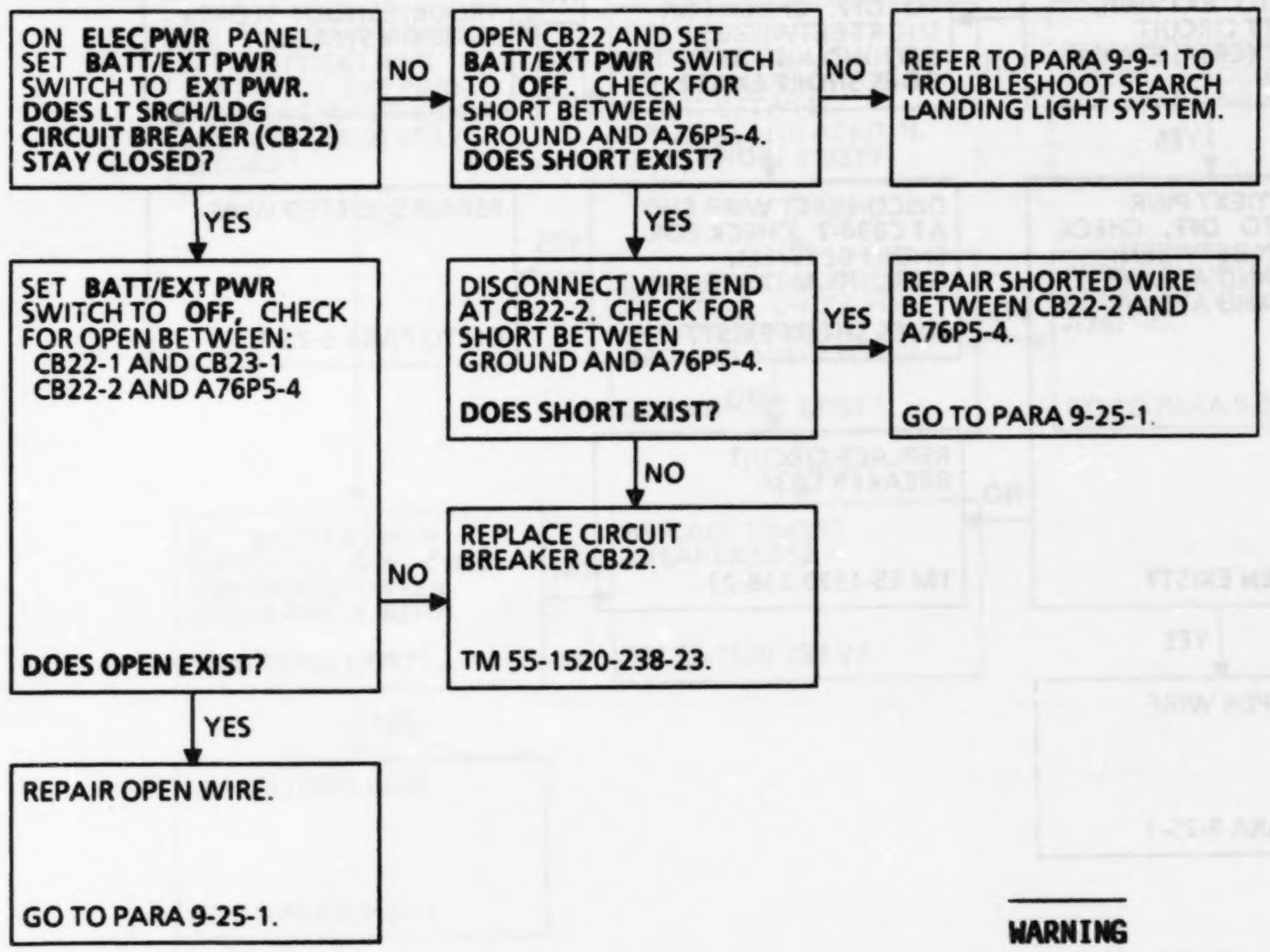
Personnel Required: (para 9-25-5)

References: (para 9-25-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT SRCH/LDG CIRCUIT BREAKER (CB22) STAY CLOSED?
NO
OPEN CB22 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P5-4. DOES SHORT EXIST?
NO
REFER TO PARA 9-9-1 TO TROUBLESHOOT SEARCH LANDING LIGHT SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB22-1 AND CB23-1 CB22-2 AND A76P5-4
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB22-2. CHECK FOR SHORT BETWEEN GROUND AND A76P5-4.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB22-2 AND A76P5-4.
GO TO PARA 9-25-1.
NO
NO
REPLACE CIRCUIT BREAKER CB22.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-7. APU HOLD CIRCUIT BREAKER (CB10) - DOES NOT STAY CLOSED OR CONTINUITY TO BTL DISCHARGE/APU PANEL DOES NOT EXIST BETWEEN A76J1-h AND -B

Tools: (para 9-25-5)

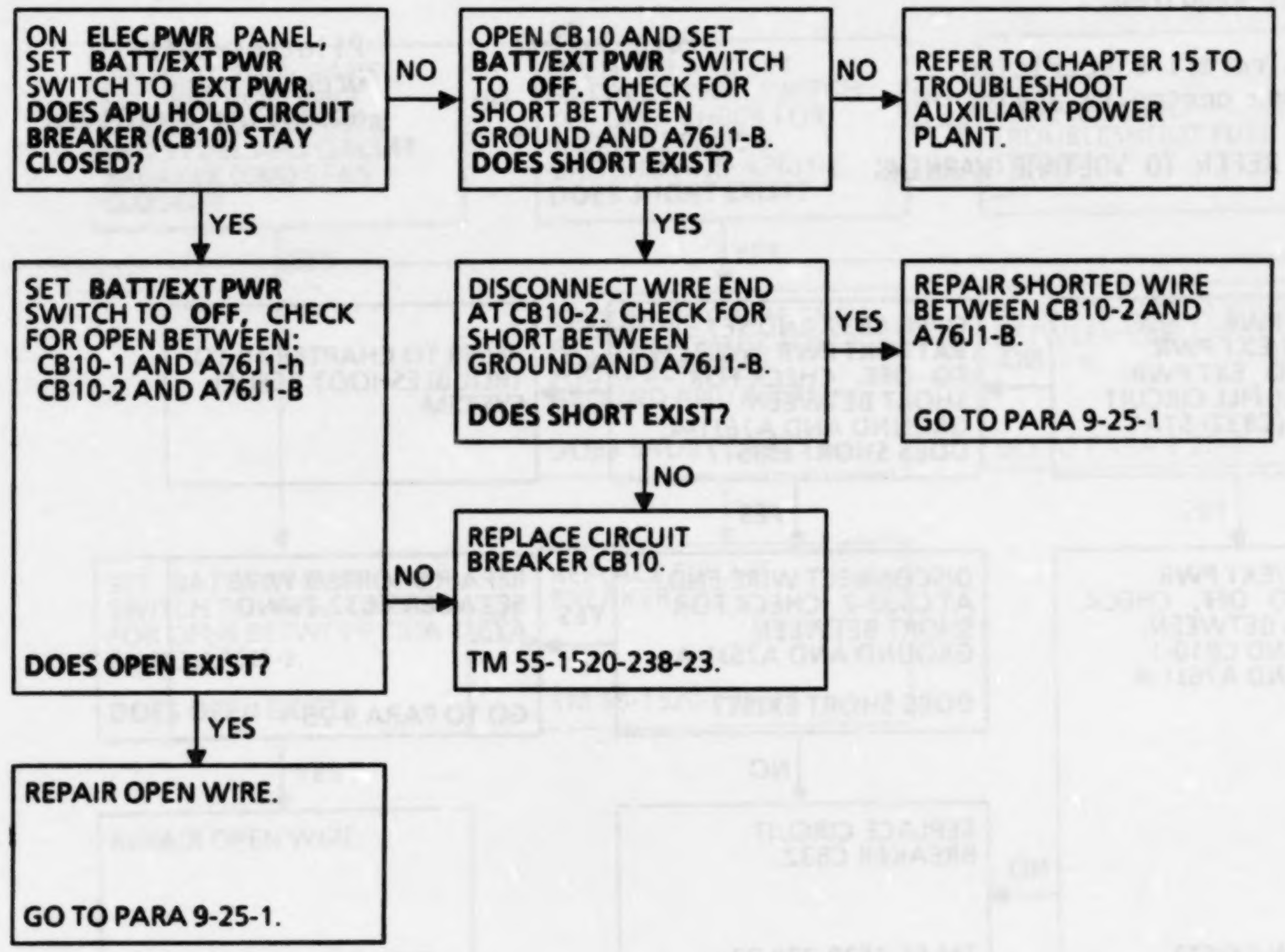
Personnel Required: (para 9-25-5)

References: (para 9-25-5)

Equipment Conditions: (para 9-25-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES APU HOLD CIRCUIT BREAKER (CB10) STAY CLOSED?
NO
OPEN CB10 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-B. DOES SHORT EXIST?
NO
REFER TO CHAPTER 15 TO TROUBLESHOOT AUXILIARY POWER PLANT.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB10-1 AND A76J1-h CB10-2 AND A76J1-B
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB10-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-B.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB10-2 AND A76J1-B.
GO TO PARA 9-25-1
NO
NO
REPLACE CIRCUIT BREAKER CB10.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-8. FUEL FILL CIRCUIT BREAKER (CB32) - DOES NOT STAY CLOSED OR CONTINUITY TO REFUEL PANEL DOES NOT EXIST BETWEEN A76J1-h AND -A

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

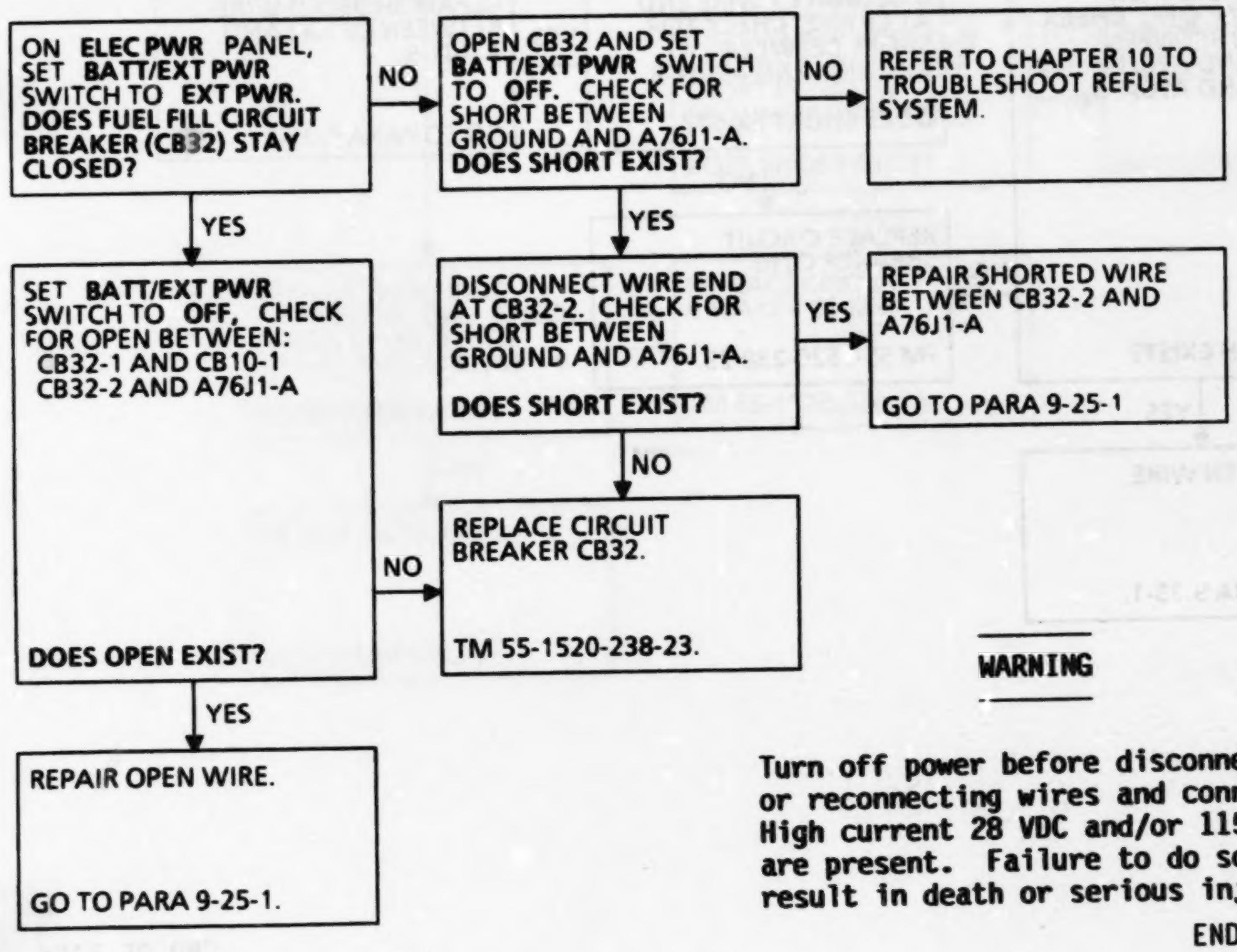
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FUEL FILL CIRCUIT BREAKER (CB32) STAY CLOSED?
NO
OPEN CB32 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-A. DOES SHORT EXIST?
NO
REFER TO CHAPTER 10 TO TROUBLESHOOT REFUEL SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB32-1 AND CB10-1 CB32-2 AND A76J1-A
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB32-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-A.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB32-2 AND A76J1-A
GO TO PARA 9-25-1
NO
REPLACE CIRCUIT BREAKER CB32.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-9. JETT CIRCUIT BREAKER (CB34) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT AND CPG COLLECTIVE STICK ST JETT SWITCH IS NOT PRESENT AT A76J1-P, -R

Tools: (para 9-25-8)

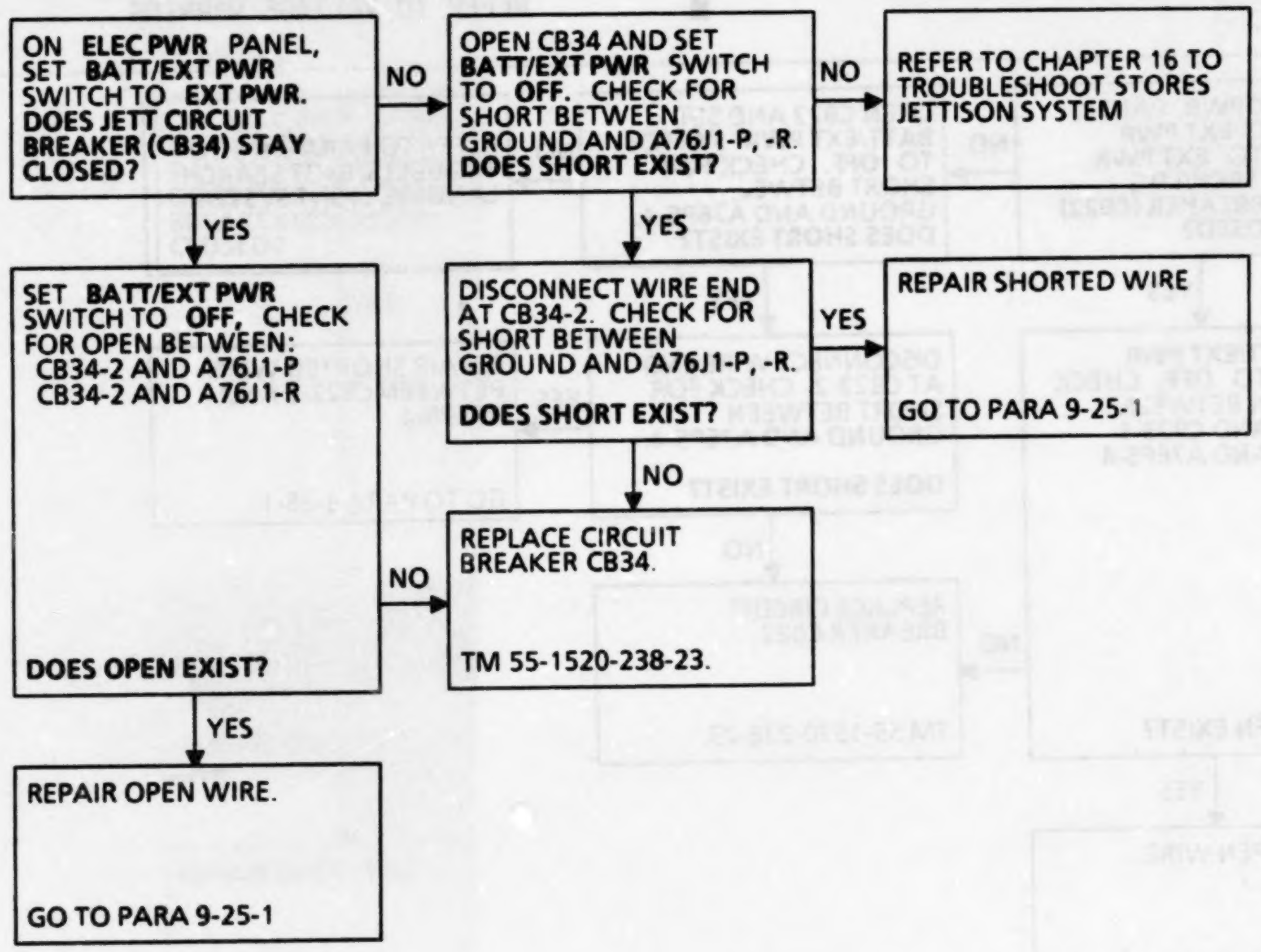
Personnel Required: (para 9-25-8)

References: (para 9-25-8)

Equipment Conditions: (para 9-25-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES JETT CIRCUIT BREAKER (CB34) STAY CLOSED?
NO
OPEN CB34 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-P, -R. DOES SHORT EXIST?
NO
REFER TO CHAPTER 16 TO TROUBLESHOOT STORES JETTISON SYSTEM
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB34-2 AND A76J1-P CB34-2 AND A76J1-R
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB34-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-P, -R.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE
GO TO PARA 9-25-1
NO
REPLACE CIRCUIT BREAKER CB34.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1

END OF TASK

9-25-10. ENG WARN CIRCUIT BREAKER (CB52) - DOES NOT STAY CLOSED OR 28 VDC TO ENGINE OUT WARNING UNIT IS NOT PRESENT AT A76J1-N

Tools: (para 9-25-8)

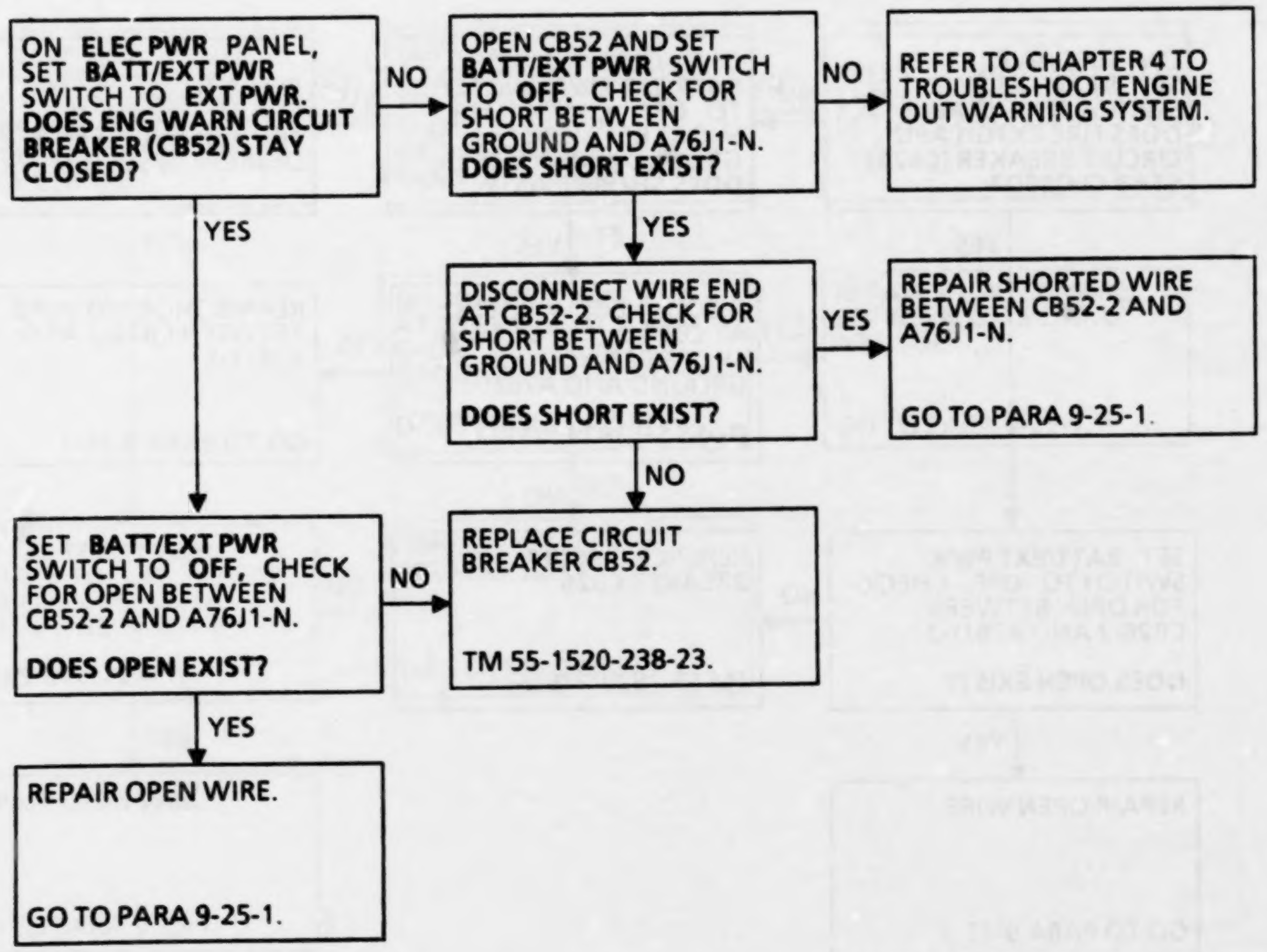
Personnel Required: (para 9-25-8)

References: (para 9-25-8)

Equipment Conditions: (para 9-25-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG WARN CIRCUIT BREAKER (CB52) STAY CLOSED?
NO
OPEN CB52 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-N. DOES SHORT EXIST?
NO
REFER TO CHAPTER 4 TO TROUBLESHOOT ENGINE OUT WARNING SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB52-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-N. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB52-2 AND A76J1-N. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB52-2 AND A76J1-N. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB52. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-11. FUEL APU CIRCUIT BREAKER (CB9) - DOES NOT STAY CLOSED OR 28 VDC TO GROUND SERVICE UTILITY RECEPTACLE IS NOT PRESENT AT A76J1-z

Tools: (para 9-25-8)

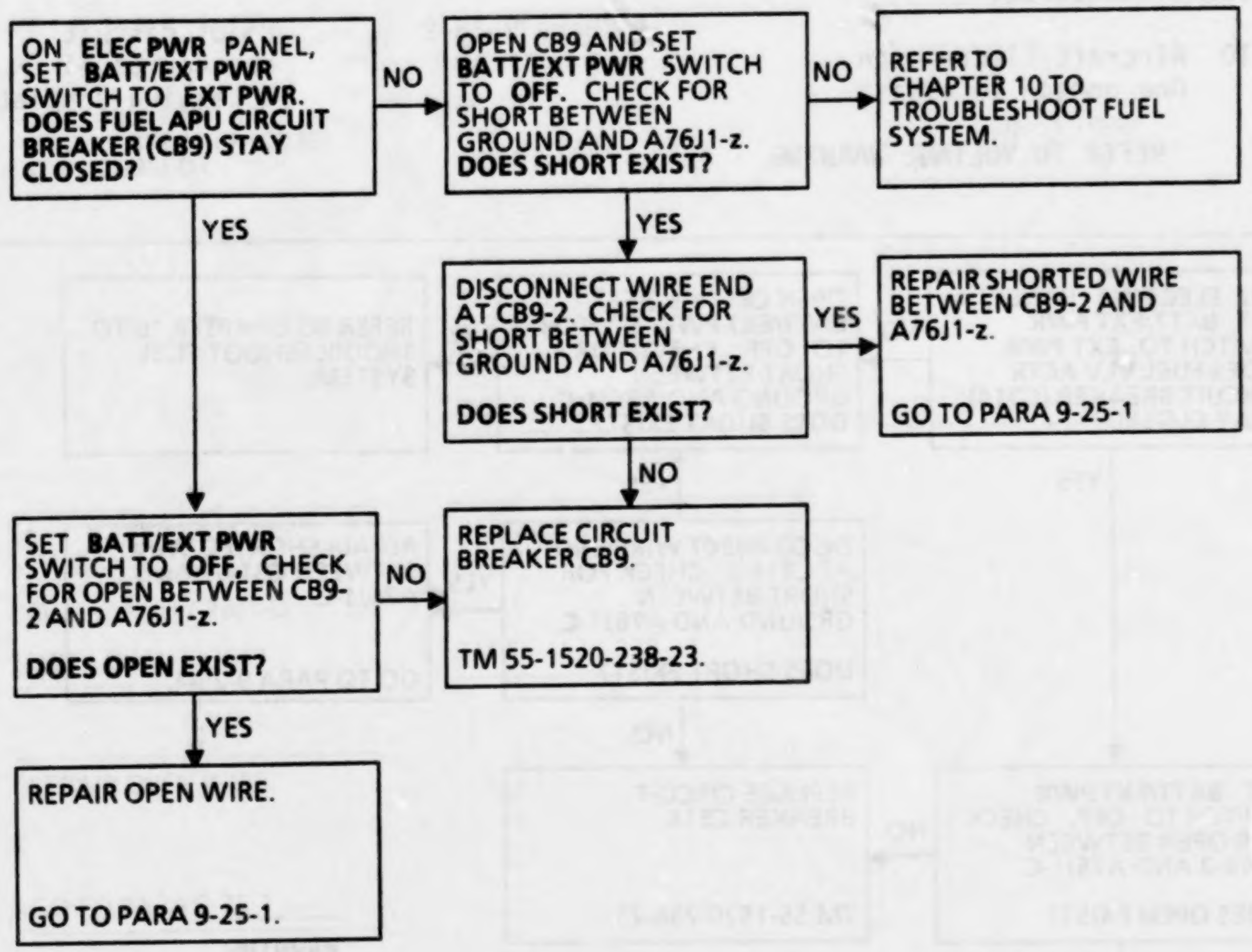
Personnel Required: (para 9-25-8)

References: (para 9-25-8)

Equipment Conditions: (para 9-25-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FUEL APU CIRCUIT BREAKER (CB9) STAY CLOSED?
NO
OPEN CB9 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-z. DOES SHORT EXIST?
NO
REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB9-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-z. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB9-2 AND A76J1-z. GO TO PARA 9-25-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB9-2 AND A76J1-z. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB9. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-12. FUEL VLV ACTR CIRCUIT BREAKER (CB14) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT FIRE EXTINGUISH PANEL IS NOT PRESENT AT A76J1-C

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

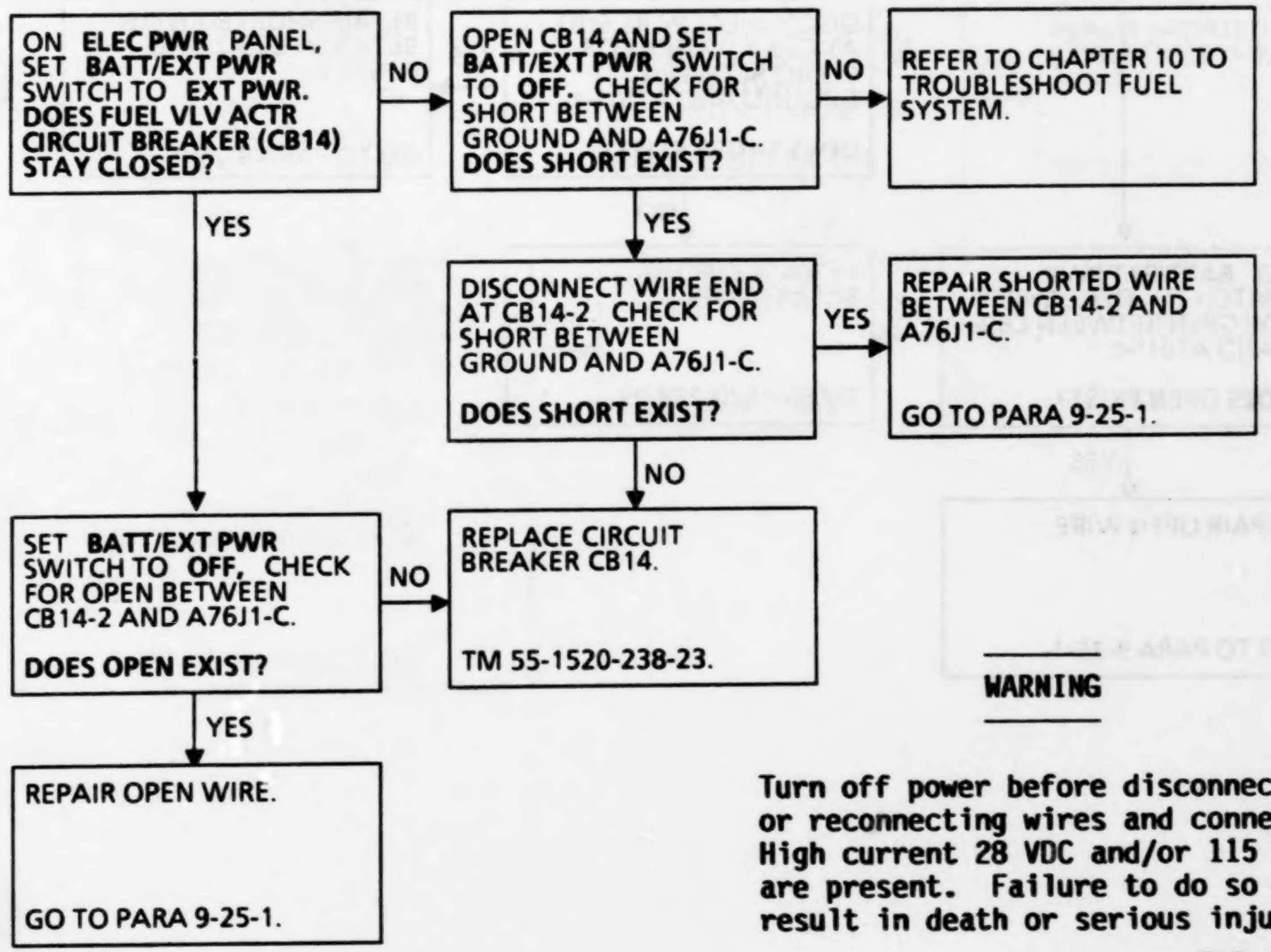
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FUEL VLV ACTR CIRCUIT BREAKER (CB14) STAY CLOSED?
NO
OPEN CB14 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-C. DOES SHORT EXIST?
NO
REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB14-2 CHECK FOR SHORT BETWEEN GROUND AND A76J1-C. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB14-2 AND A76J1-C. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB14-2 AND A76J1-C. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB14. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-13. FIRE EXTGH APU CIRCUIT BREAKER (CB26 - DOES NOT STAY CLOSED OR 28 VDC TO BTL DISCHARGE/APU PANEL IS NOT PRESENT AT A76J1-J

Tools: (para 9-25-12)

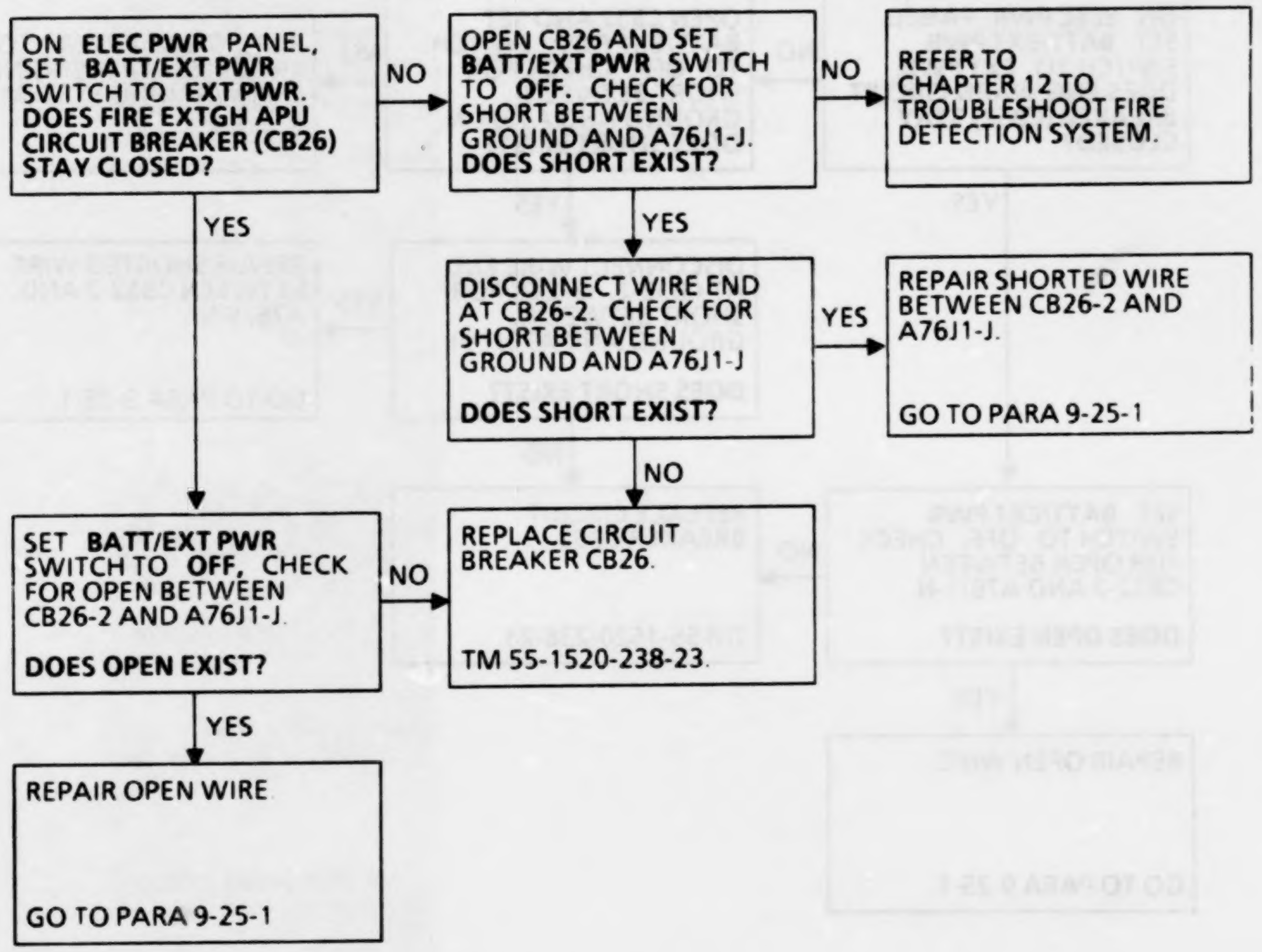
Personnel Required: (para 9-25-12)

References: (para 9-25-12)

Equipment Conditions: (para 9-25-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE EXTGH APU CIRCUIT BREAKER (CB26) STAY CLOSED?
NO
OPEN CB26 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-J. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB26-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-J DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB26-2 AND A76J1-J. GO TO PARA 9-25-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB26-2 AND A76J1-J. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB26. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE GO TO PARA 9-25-1

END OF TASK

9-25-14. FIRE EXTGH CPG CIRCUIT BREAKER (CB15) - DOES NOT STAY CLOSED OR 28 VDC TO CPG FIRE EXTINGUISH PANEL IS NOT PRESENT AT A76J1-H

Tools: (para 9-25-12)

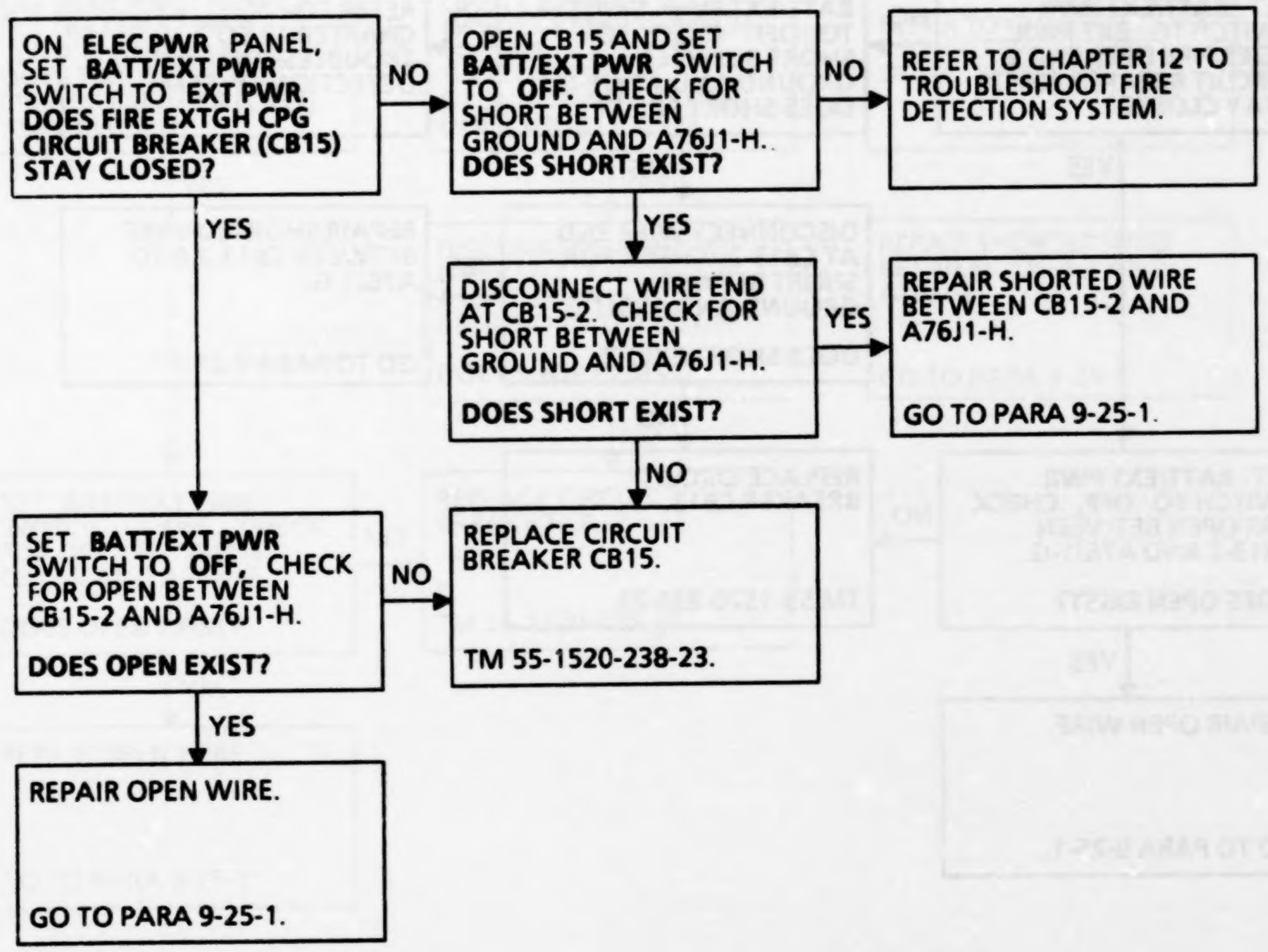
Personnel Required: (para 9-25-12)

References: (para 9-25-12)

Equipment Conditions: (para 9-25-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE EXTGH CPG CIRCUIT BREAKER (CB15) STAY CLOSED?
NO
OPEN CB15 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-H. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.
YES
DISCONNECT WIRE END AT CB15-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-H. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB15-2 AND A76J1-H. GO TO PARA 9-25-1.
NO
REPLACE CIRCUIT BREAKER CB15. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB15-2 AND A76J1-H. DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-15. FIRE EXTGH PLT CIRCUIT BREAKER (CB25) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT FIRE EXTINGUISH PANEL IS NOT PRESENT AT A76J1-D

Tools: (para 9-25-12)

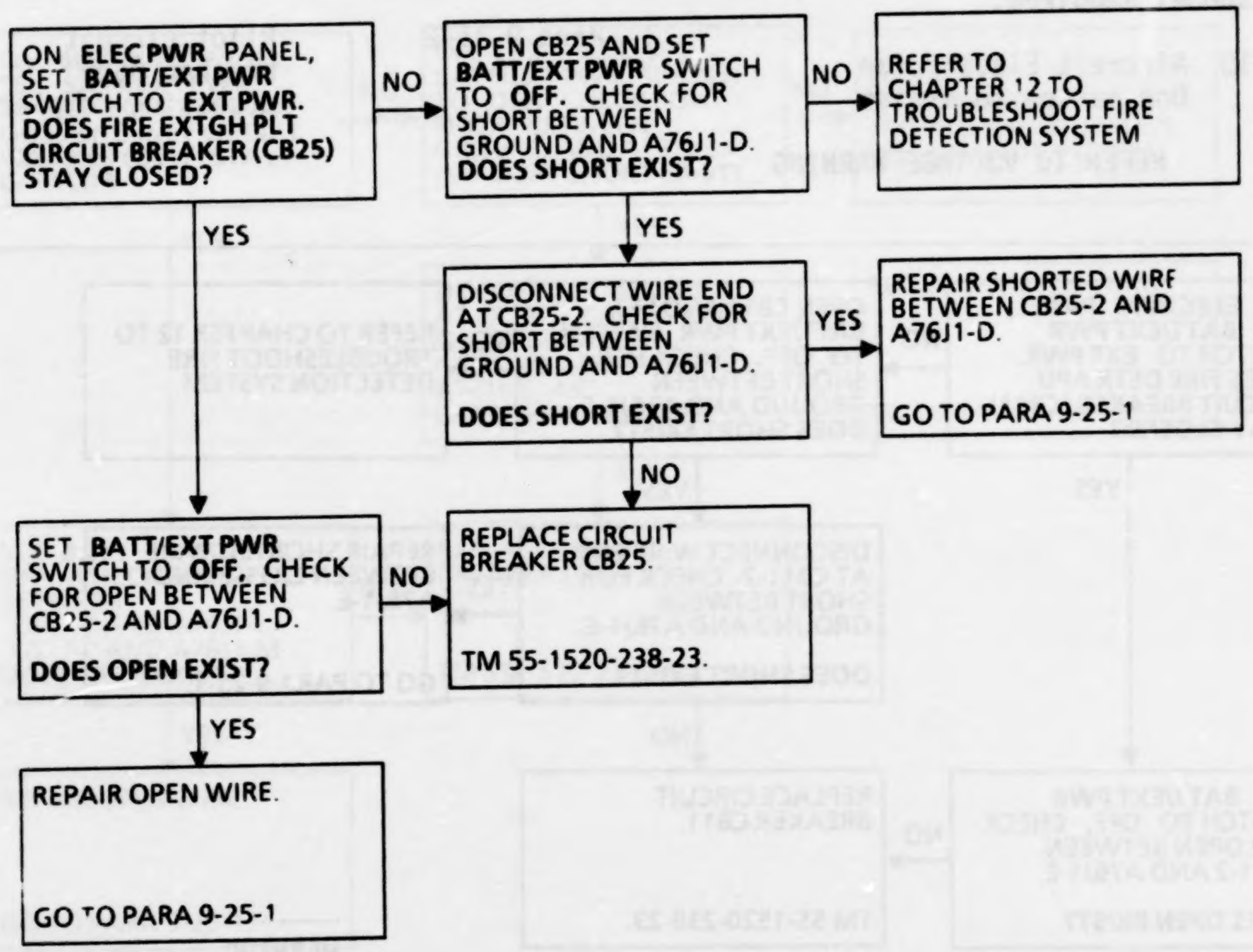
Personnel Required: (para 9-25-12)

References: (para 9-15-12)

Equipment Conditions: (para 9-25-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE EXTGH PLT CIRCUIT BREAKER (CB25) STAY CLOSED?
NO
OPEN CB25 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-D. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM
YES
DISCONNECT WIRE END AT CB25-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-D. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB25-2 AND A76J1-D. GO TO PARA 9-25-1
NO
REPLACE CIRCUIT BREAKER CB25. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB25-2 AND A76J1-D. DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1

END OF TASK

9-25-16. FIRE DETR APU CIRCUIT BREAKER (CB11) - DOES NOT STAY CLOSED OR 28 VDC TO APU FLAME DETECTOR IS NOT PRESENT AT A76J1-E

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

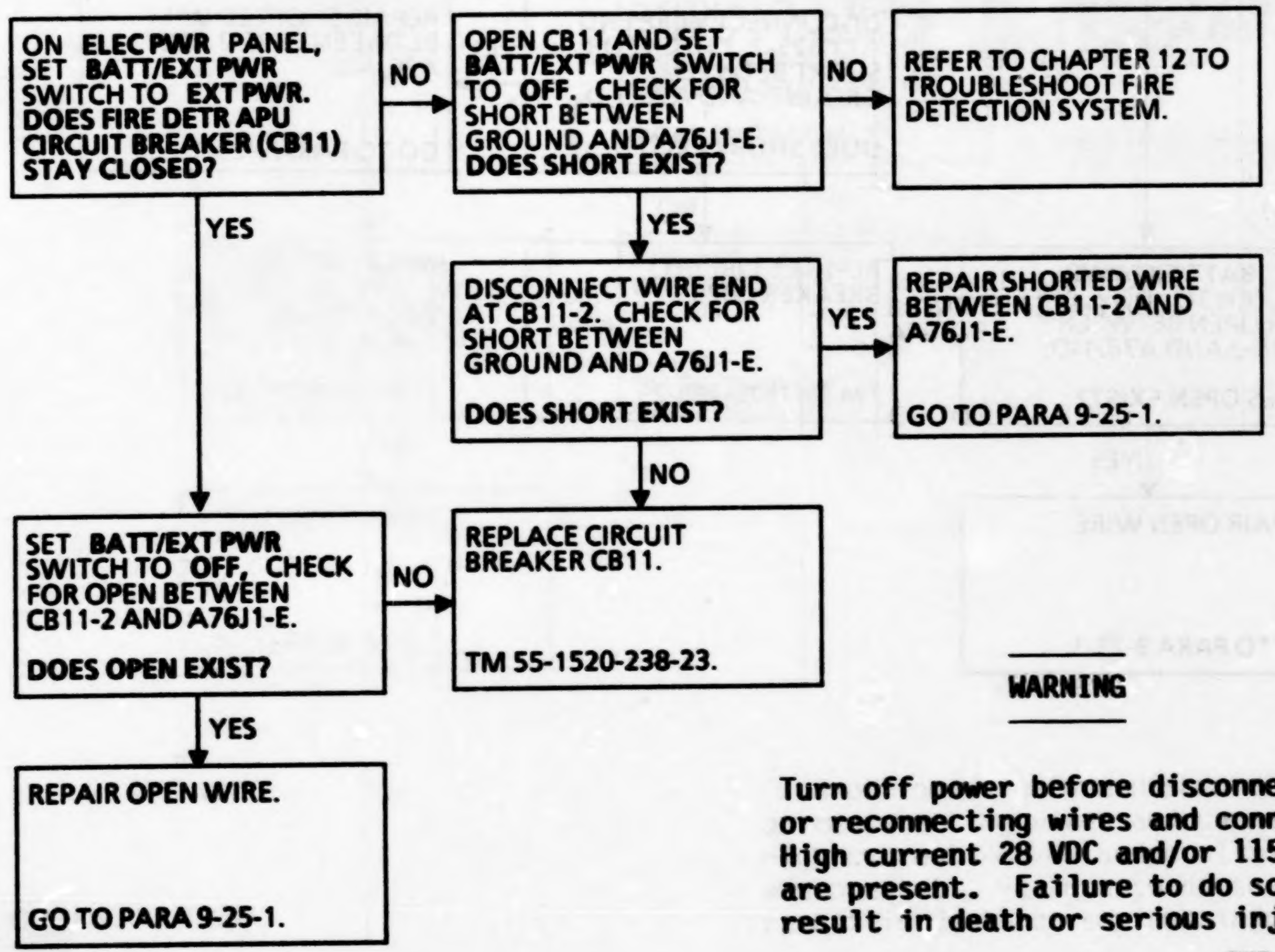
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE DETR APU CIRCUIT BREAKER (CB11) STAY CLOSED?

OPEN CB11 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-E. DOES SHORT EXIST?

REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.

DISCONNECT WIRE END AT CB11-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-E. DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB11-2 AND A76J1-E. GO TO PARA 9-25-1.

SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB11-2 AND A76J1-E. DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB11. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-17. FIRE DETR ENG 2 CIRCUIT BREAKER (CB13) - DOES NOT STAY CLOSED OR 28 VDC TO ENGINE 2 FLAME DETECTOR IS NOT PRESENT AT A76J1-G

Tools: (para 9-25-16)

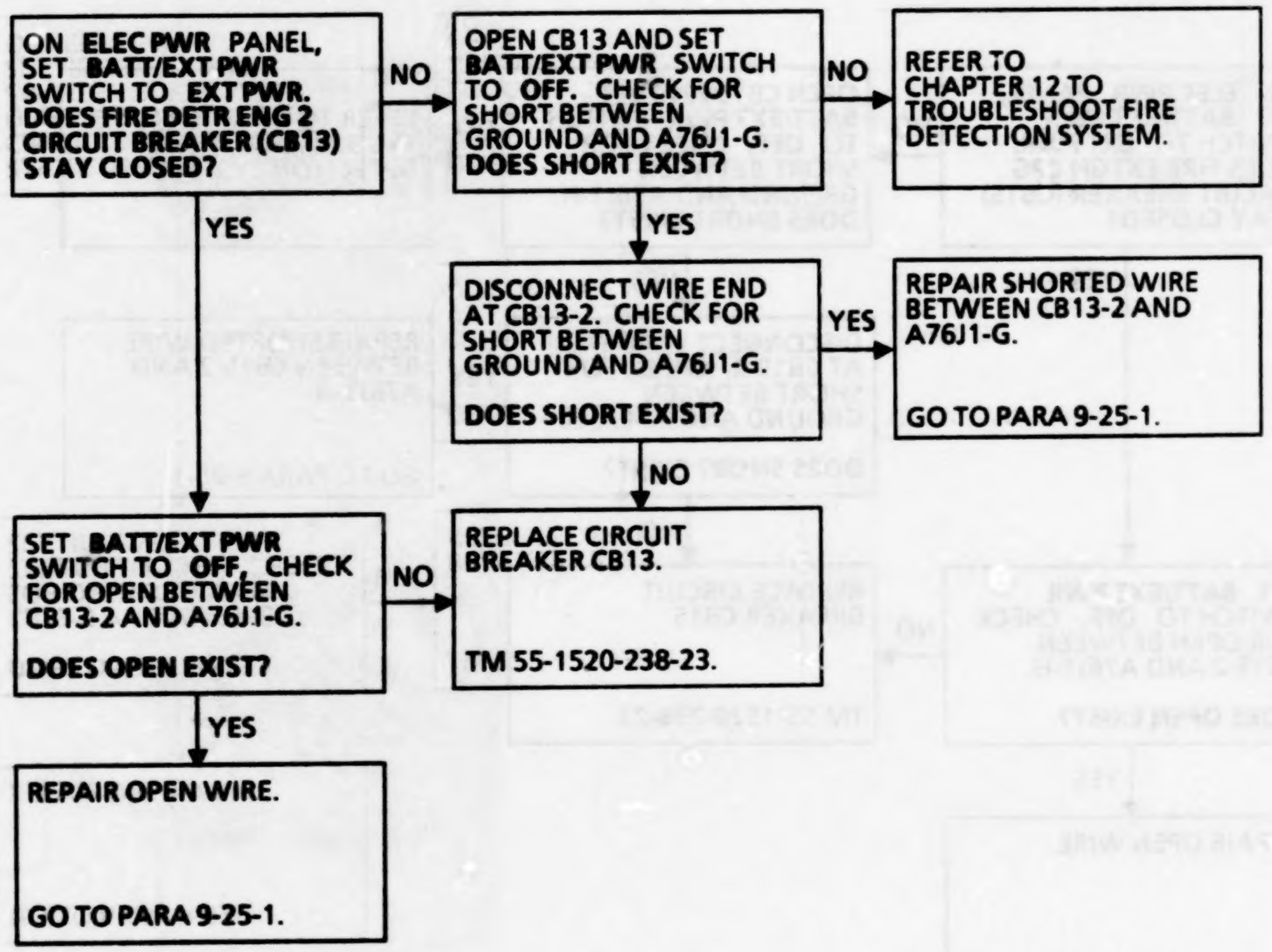
Personnel Required: (para 9-25-16)

References: (para 9-25-16)

Equipment Conditions: (para 9-25-16)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE DETR ENG 2 CIRCUIT BREAKER (CB13) STAY CLOSED?

OPEN CB13 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-G. DOES SHORT EXIST?

REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.

DISCONNECT WIRE END AT CB13-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-G. DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB13-2 AND A76J1-G. GO TO PARA 9-25-1.

SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB13-2 AND A76J1-G. DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB13. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-18. FIRE DETR ENG 1 CIRCUIT BREAKER (CB12) - DOES NOT STAY CLOSED OR 28 VDC TO ENGINE 1 FLAME DETECTOR IS NOT PRESENT AT A76J1-F

Tools: (para 9-25-16)

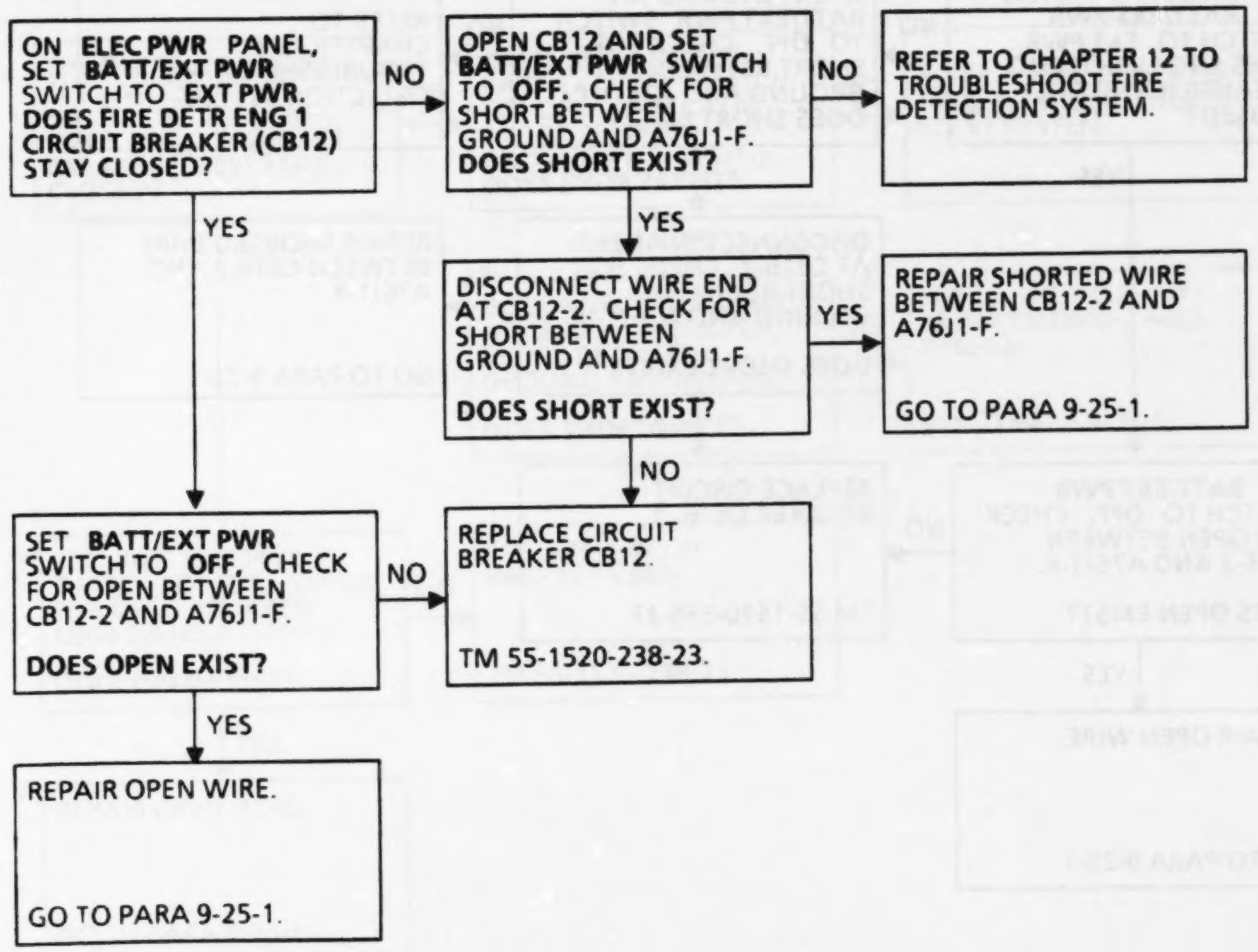
Personnel Required: (para 9-25-16)

References: (para 9-25-16)

Equipment Conditions: (para 9-25-16)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE DETR ENG 1 CIRCUIT BREAKER (CB12) STAY CLOSED?
NO
OPEN CB12 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-F. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB12-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-F. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB12-2 AND A76J1-F. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB12-2 AND A76J1-F. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB12. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-19. ENG INST CIRCUIT BREAKER (CB17) - DOES NOT STAY CLOSED OR 28 VDC TO SIGNAL DATA CONVERTER IS NOT PRESENT AT A76J1-L, -M

Tools: (para 9-25-16)

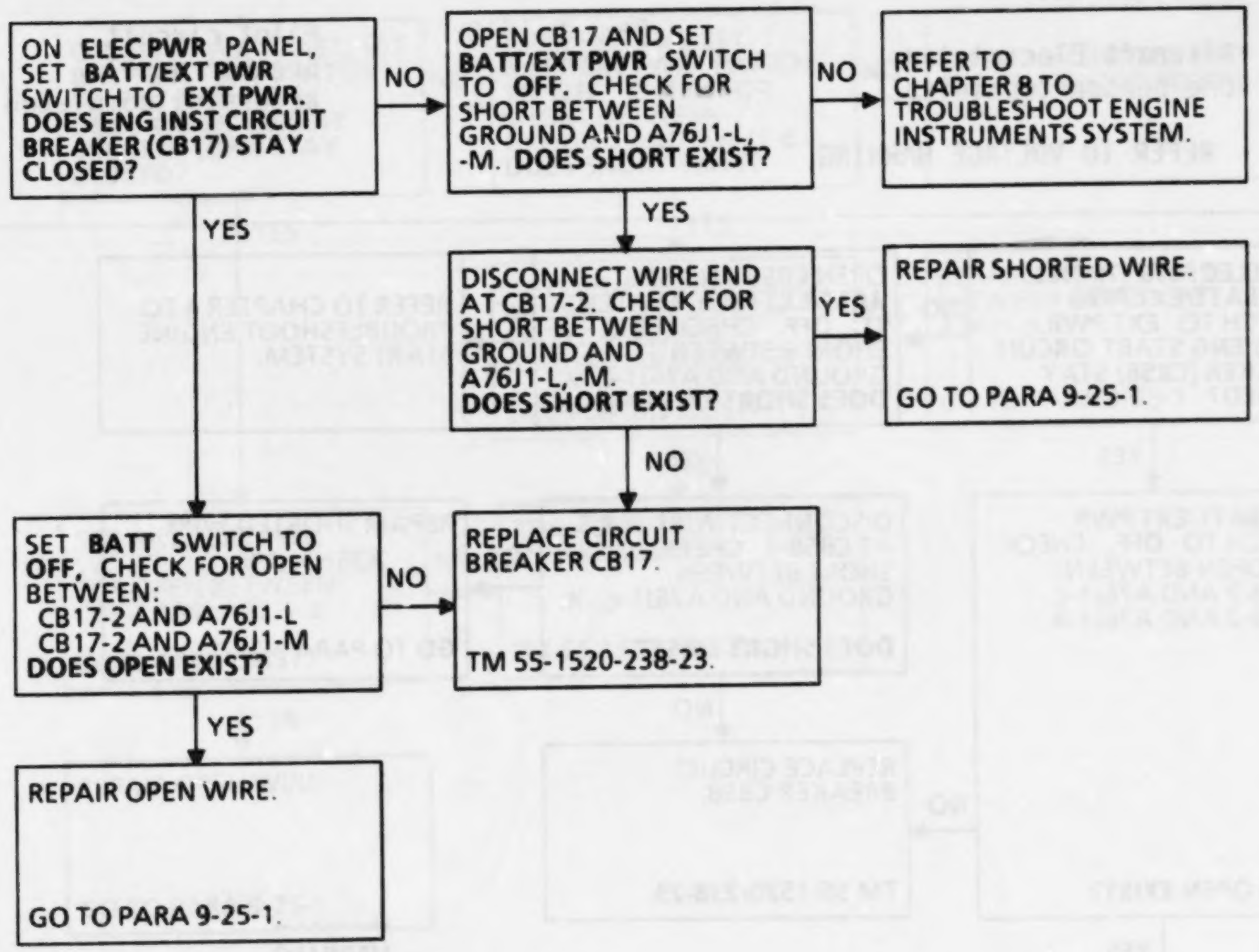
Personnel Required: (para 9-25-16)

References: (para 9-25-16)

Equipment Conditions: (para 9-25-16)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG INST CIRCUIT BREAKER (CB17) STAY CLOSED?
NO
OPEN CB17 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-L, -M. DOES SHORT EXIST?
NO
REFER TO CHAPTER 8 TO TROUBLESHOOT ENGINE INSTRUMENTS SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB17-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-L, -M. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-25-1.
NO
SET BATT SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB17-2 AND A76J1-L CB17-2 AND A76J1-M DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB17. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-20. ENG START CIRCUIT BREAKER (CB58) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT POWER QUADRANT IS NOT PRESENT AT A76J1-c, -X

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

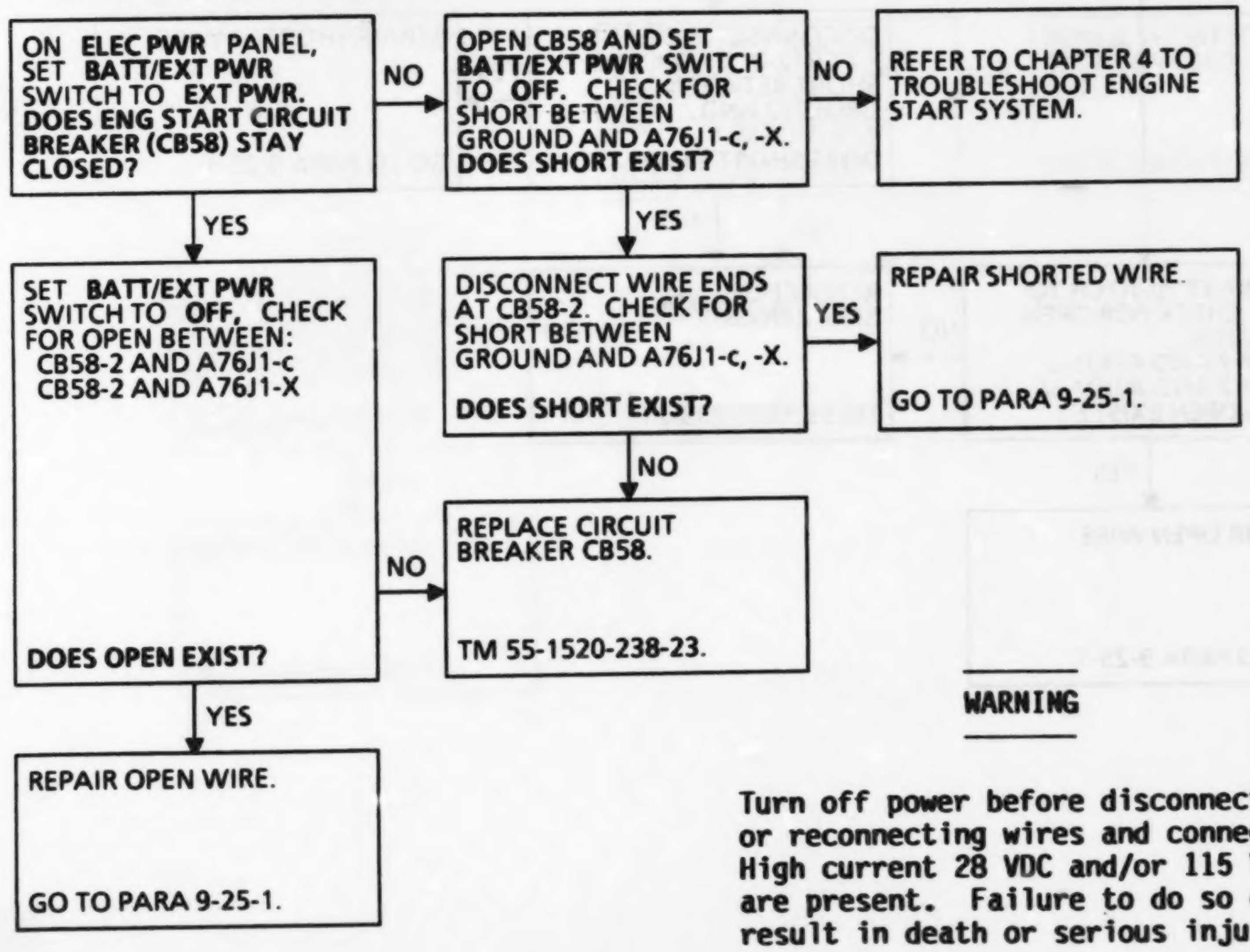
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG START CIRCUIT BREAKER (CB58) STAY CLOSED?
NO
OPEN CB58 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-c, -X. DOES SHORT EXIST?
NO
REFER TO CHAPTER 4 TO TROUBLESHOOT ENGINE START SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB58-2 AND A76J1-c CB58-2 AND A76J1-X
DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB58-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-c, -X.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-25-1.
NO
NO
REPLACE CIRCUIT BREAKER CB58.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-21. ENG LVR CIRCUIT BREAKER (CB16) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT FIRE EXTINGUISH PANEL IS NOT PRESENT AT A76J1 -K

Tools: (para 9-25-20)

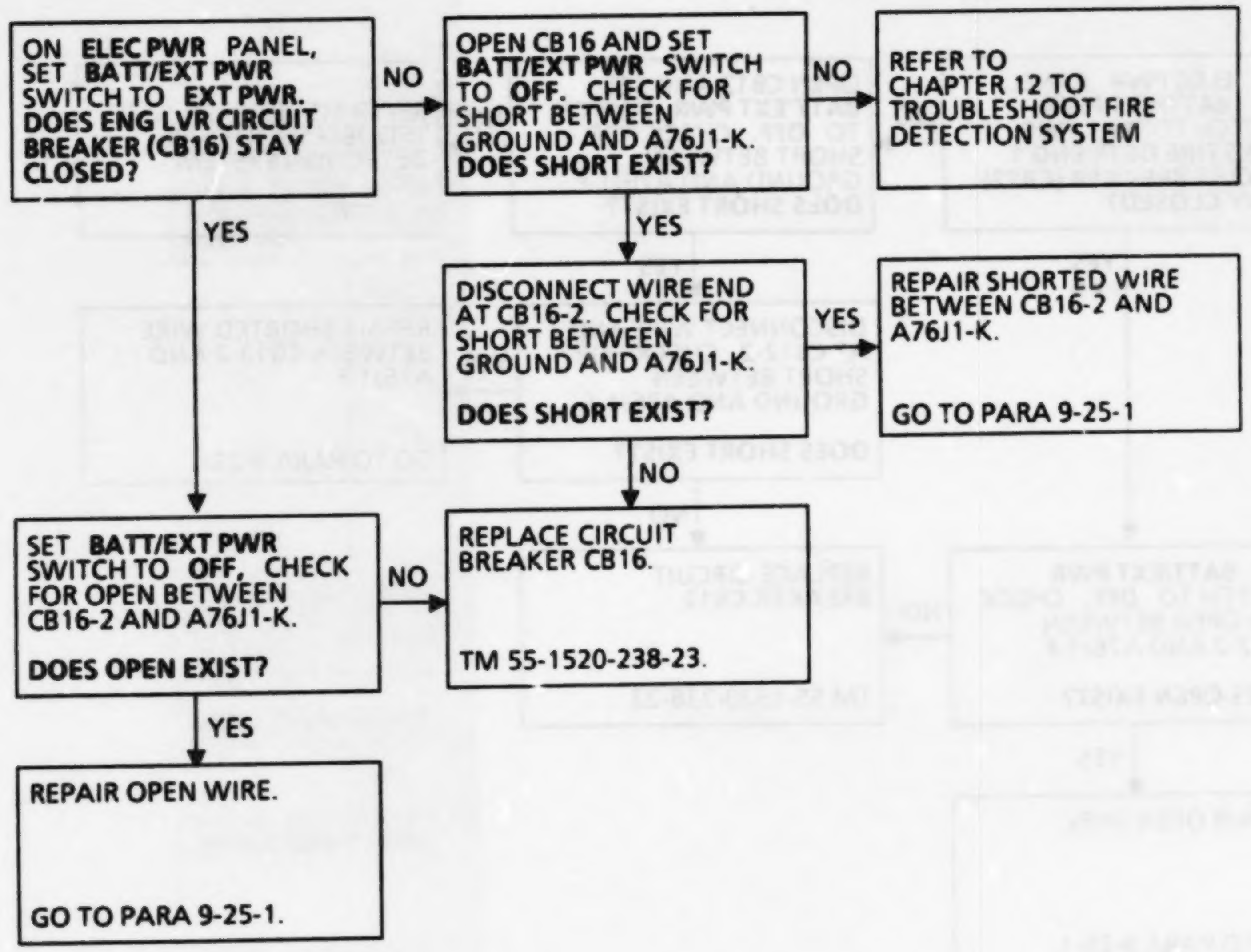
Personnel Required: (para 9-25-20)

References: (para 9-25-20)

Equipment Conditions: (para 9-25-20)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG LVR CIRCUIT BREAKER (CB16) STAY CLOSED?
NO
OPEN CB16 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-K. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM
YES
YES
DISCONNECT WIRE END AT CB16-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-K.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB16-2 AND A76J1-K.
GO TO PARA 9-25-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB16-2 AND A76J1-K.
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB16.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-22. ENG CUT CIRCUIT BREAKER (CB60) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT AND CPG COLLECTIVE STICKS IS NOT PRESENT AT A76J1-b

Tools: (para 9-25-20)

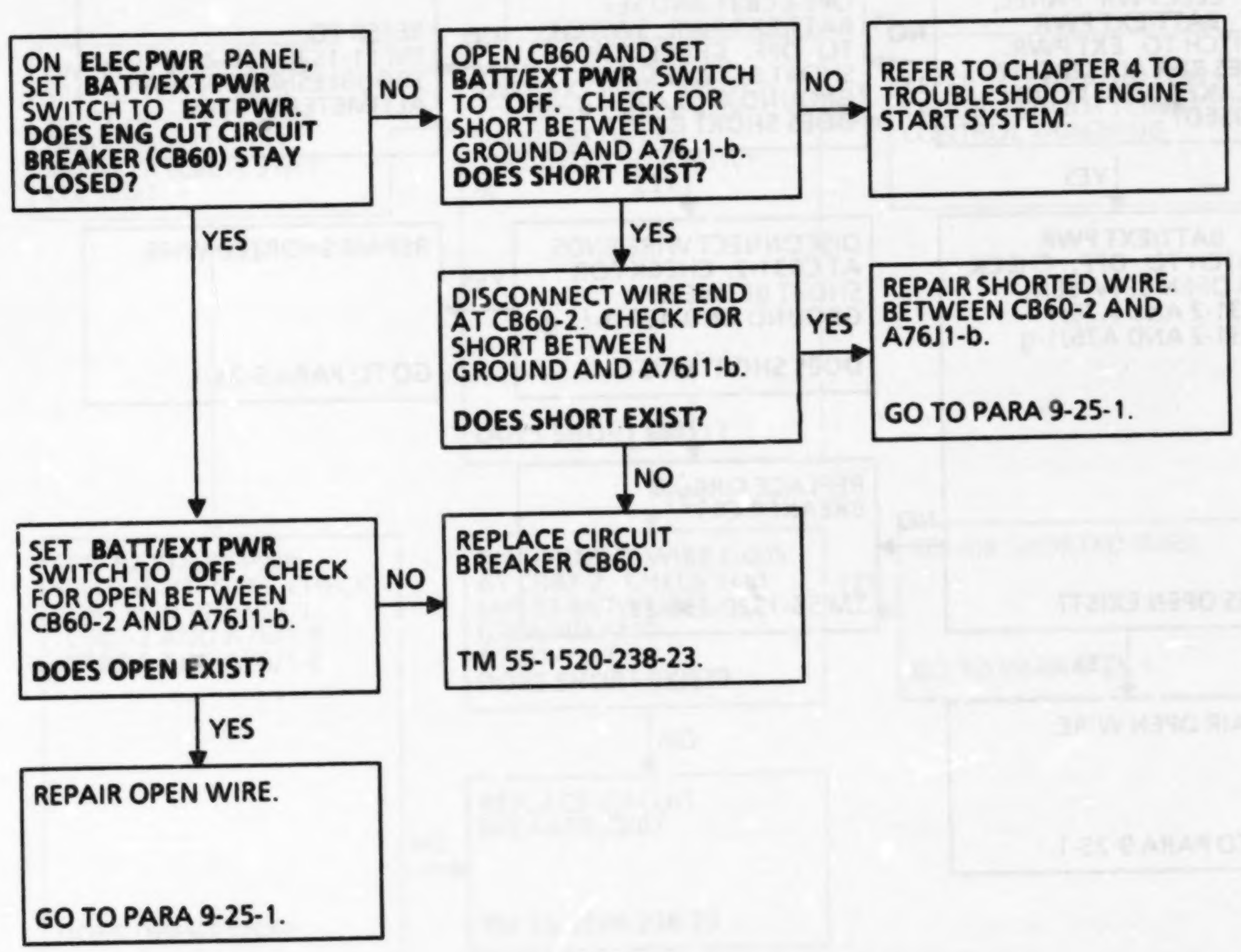
Personnel Required: (para 9-25-20)

References: (para 9-25-20)

Equipment Conditions: (para 9-25-20)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG CUT CIRCUIT BREAKER (CB60) STAY CLOSED?
NO
OPEN CB60 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-b. DOES SHORT EXIST?
NO
REFER TO CHAPTER 4 TO TROUBLESHOOT ENGINE START SYSTEM.
YES
DISCONNECT WIRE END AT CB60-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-b. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB60-2 AND A76J1-b. GO TO PARA 9-25-1.
NO
REPLACE CIRCUIT BREAKER CB60. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB60-2 AND A76J1-b. DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-23. THROT CIRCUIT BREAKER (CB8) - DOES NOT STAY CLOSED OR 28 VDC TO CPG POWER QUADRANT PANEL IS NOT PRESENT AT A76J1-d

Tools: (para 9-25-20)

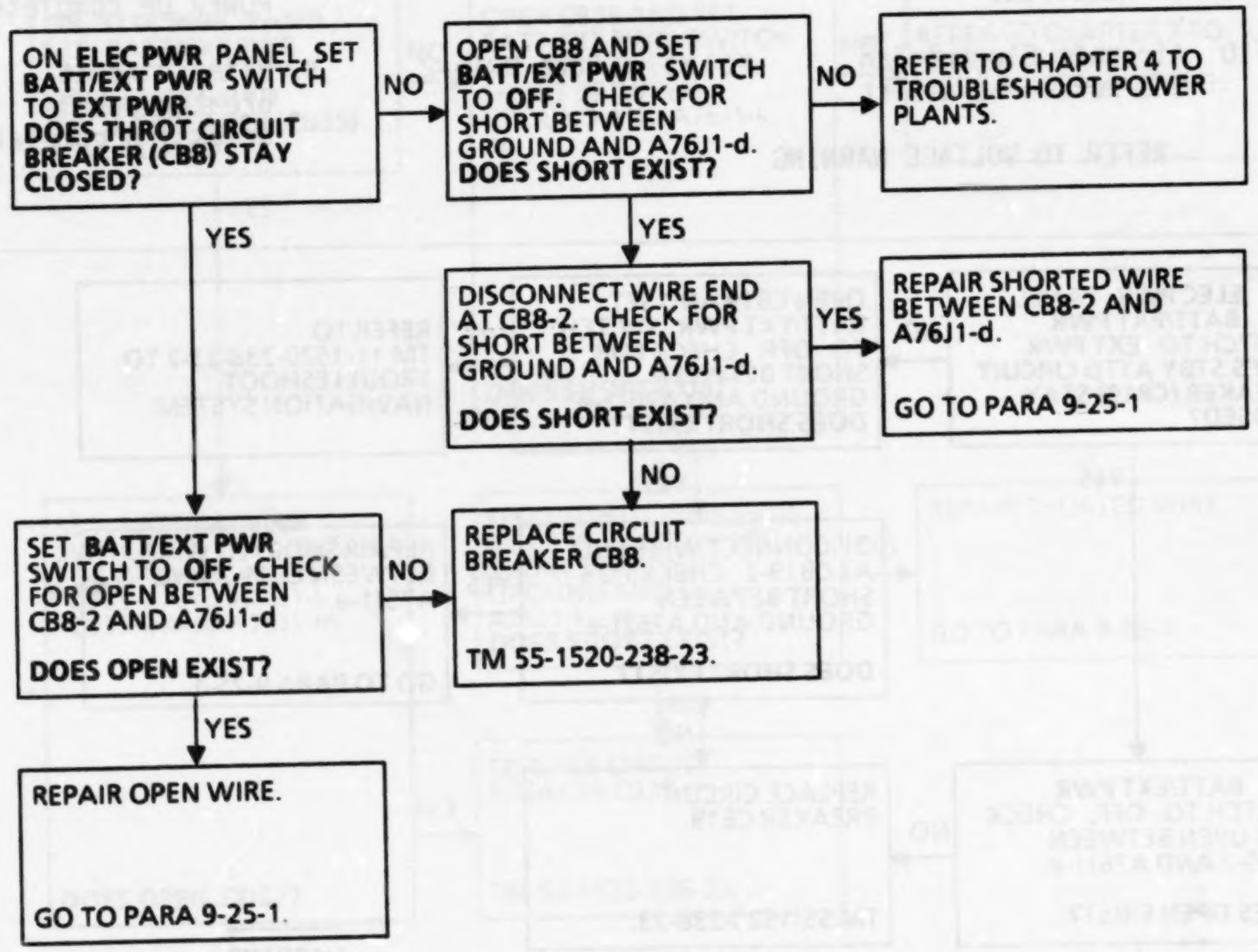
Personnel Required: (para 9-25-20)

References: (para 9-25-20

Equipment Conditions: (para 9-25-20)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES THROT CIRCUIT BREAKER (CB8) STAY CLOSED?
NO
OPEN CB8 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-d. DOES SHORT EXIST?
NO
REFER TO CHAPTER 4 TO TROUBLESHOOT POWER PLANTS.
YES
DISCONNECT WIRE END AT CB8-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-d. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB8-2 AND A76J1-d. GO TO PARA 9-25-1
NO
REPLACE CIRCUIT BREAKER CB8. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB8-2 AND A76J1-d DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-24. STBY ATTD CIRCUIT BREAKER (CB19) - DOES NOT STAY CLOSED OR 28 VDC TO STANDBY ATTITUDE INDICATOR IS NOT PRESENT AT A76J1-e

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

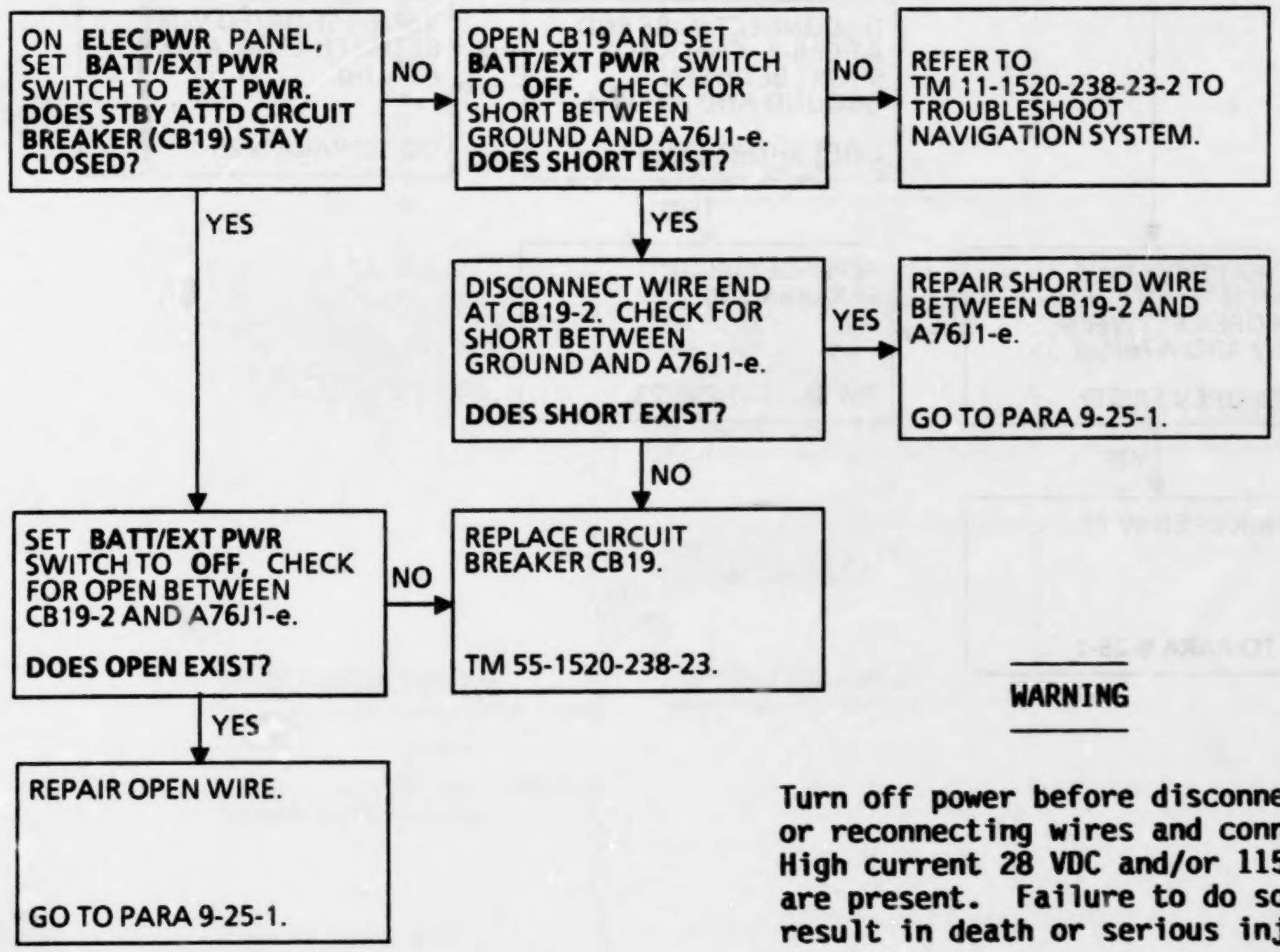
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES STBY ATTD CIRCUIT BREAKER (CB19) STAY CLOSED?
NO
OPEN CB19 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-e. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT NAVIGATION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB19-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-e. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB19-2 AND A76J1-e. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB19-2 AND A76J1-e. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB19. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-25. RDR ALT CIRCUIT BREAKER (CB31) - DOES NOT STAY CLOSED OR 28 VDC TO RADAR ALTIMETER RECEIVER AND TRANSMITTER IS NOT PRESENT AT A76J1-f, -g

Tools: (para 9-25-24)

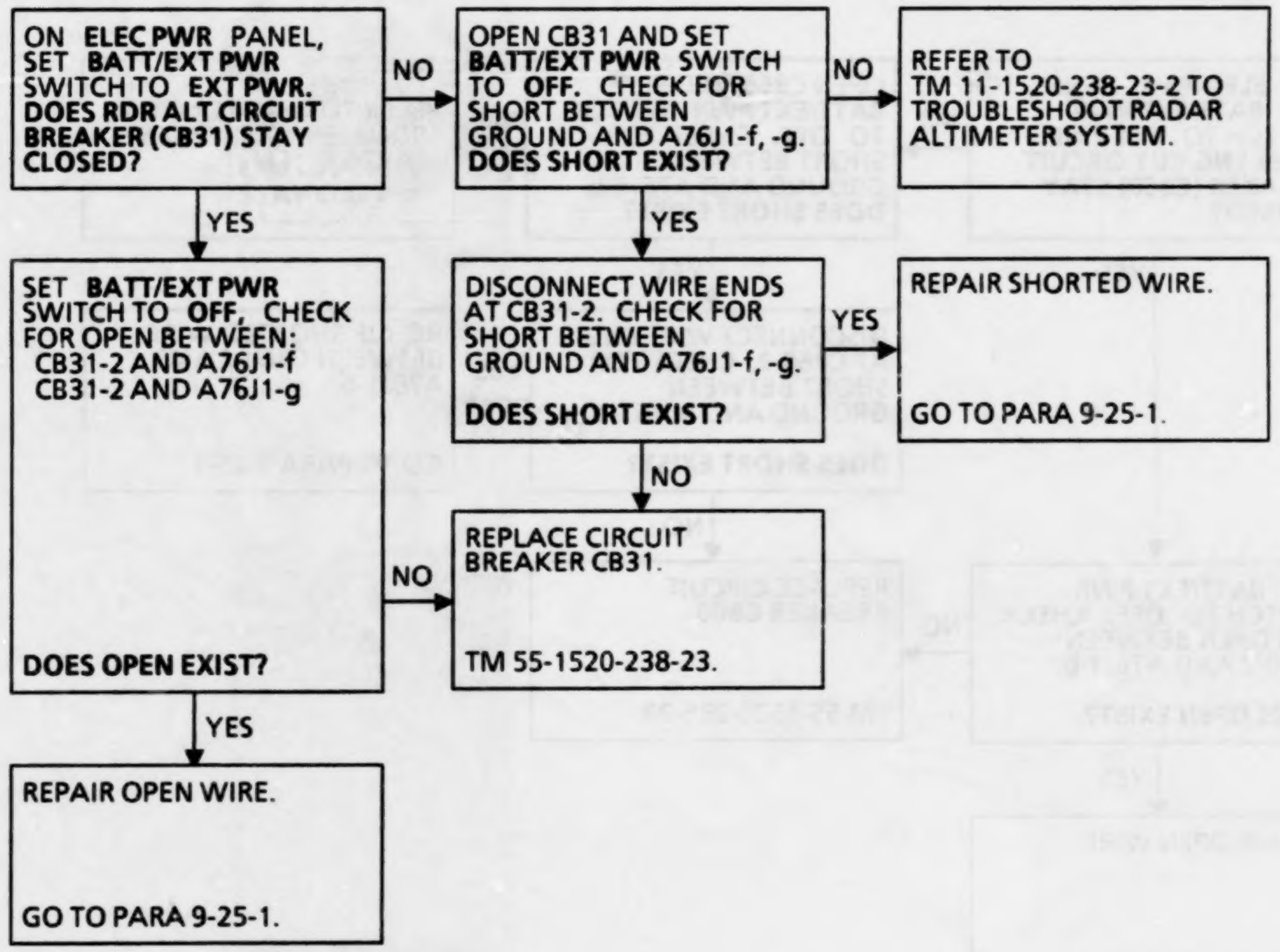
Personnel Required: (para 9-25-24)

References: (para 9-25-24)

Equipment Conditions: (para 9-25-24)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES RDR ALT CIRCUIT BREAKER (CB31) STAY CLOSED?
NO
OPEN CB31 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-f, -g. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT RADAR ALTIMETER SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB31-2 AND A76J1-f CB31-2 AND A76J1-g DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB31-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-f, -g. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-25-1.
NO
REPLACE CIRCUIT BREAKER CB31. TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-26. TRIM CIRCUIT BREAKER (CB87) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT AND CPG CYCLIC STICKS IS NOT PRESENT AT A76J1-Y, -Z

Tools: (para 9-25-24)

Personnel Required: (para 9-25-24)

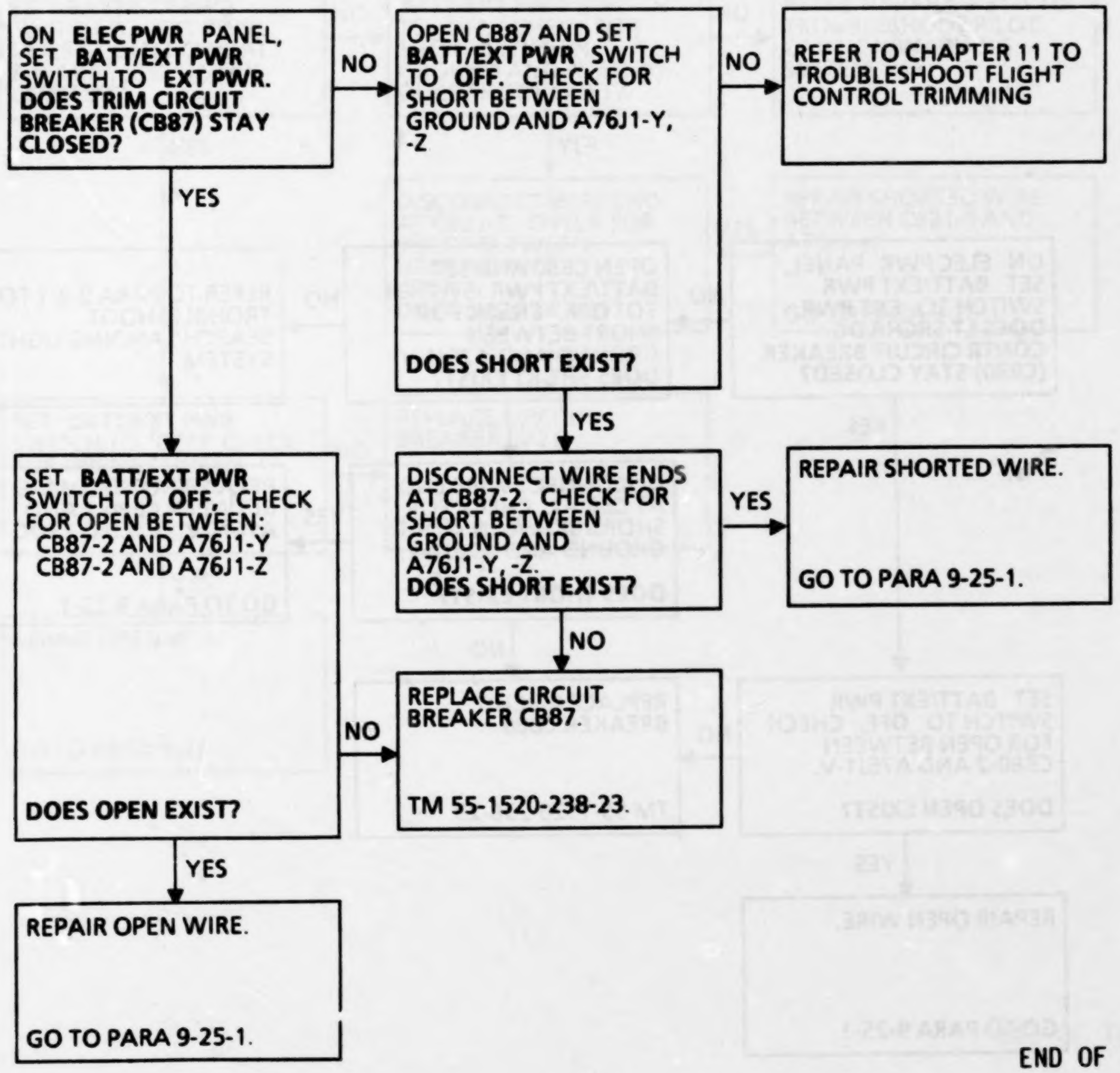
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-25-24)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES TRIM CIRCUIT BREAKER (CB87) STAY CLOSED?
NO
OPEN CB87 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-Y, -Z
DOES SHORT EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT FLIGHT CONTROL TRIMMING
YES
YES
DISCONNECT WIRE ENDS AT CB87-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-Y, -Z. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB87-2 AND A76J1-Y CB87-2 AND A76J1-Z
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB87.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-27. EMERG HYD CIRCUIT BREAKER (CB35) - DOES NOT STAY CLOSED OR 28 VDC TO PRIMARY AND UTILITY HYDRAULIC MANIFOLDS IS NOT PRESENT AT A76J1-k, -m

Tools: (para 9-25-24)

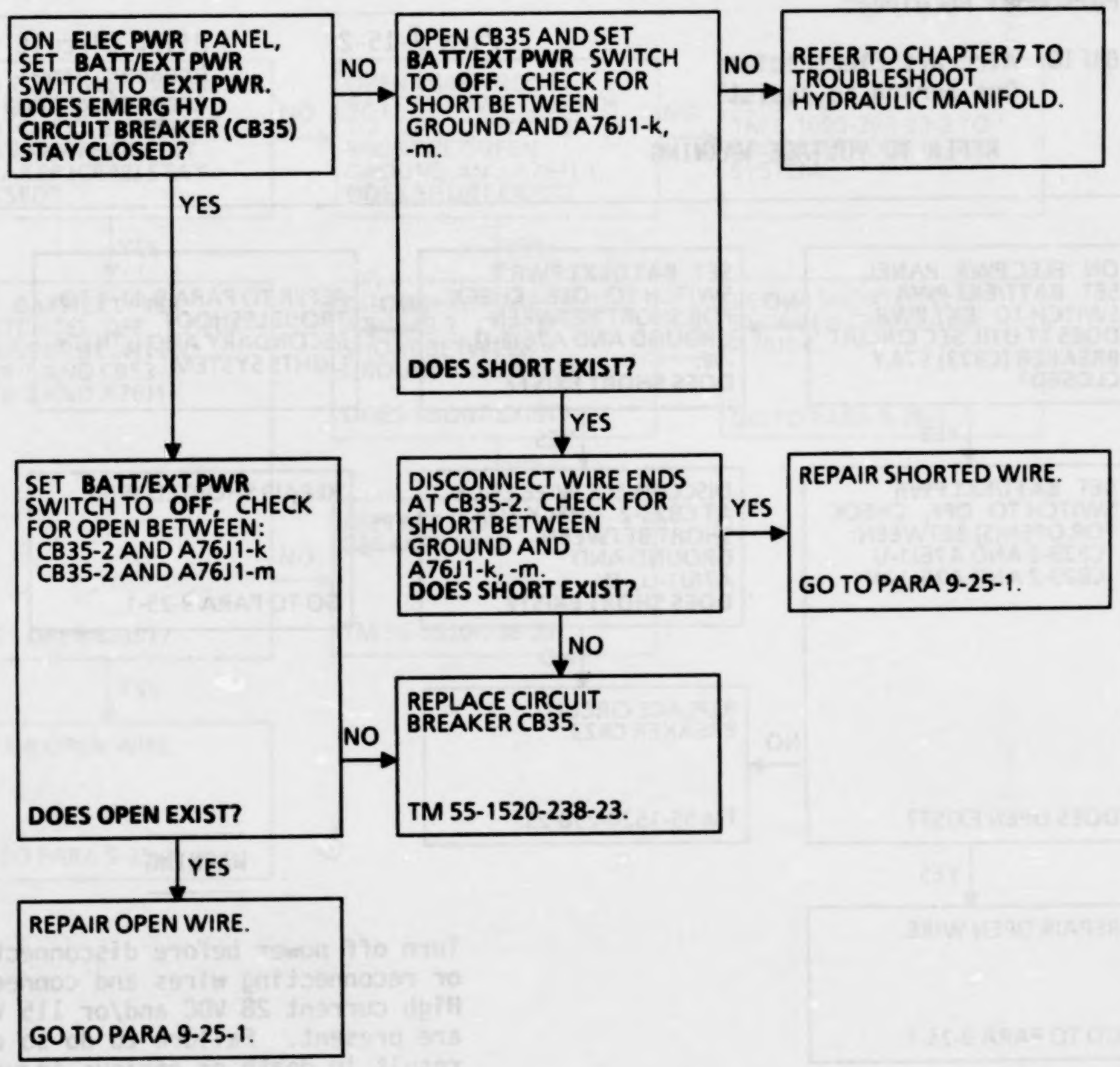
Personnel Required: (para 9-25-24)

References: (para 9-25-26)

Equipment Conditions: (para 9-25-24)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES EMERG HYD CIRCUIT BREAKER (CB35) STAY CLOSED?
NO
OPEN CB35 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-k, -m.
DOES SHORT EXIST?
NO
REFER TO CHAPTER 7 TO TROUBLESHOOT HYDRAULIC MANIFOLD.
YES
YES
DISCONNECT WIRE ENDS AT CB35-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-k, -m. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB35-2 AND A76J1-k CB35-2 AND A76J1-m
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB35.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-28. LT UTIL SEC CIRCUIT BREAKER (CB23) - DOES NOT STAY CLOSED OR 28 VDC TO UTILITY LIGHTS IS NOT PRESENT AT A76J1-U, -W

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

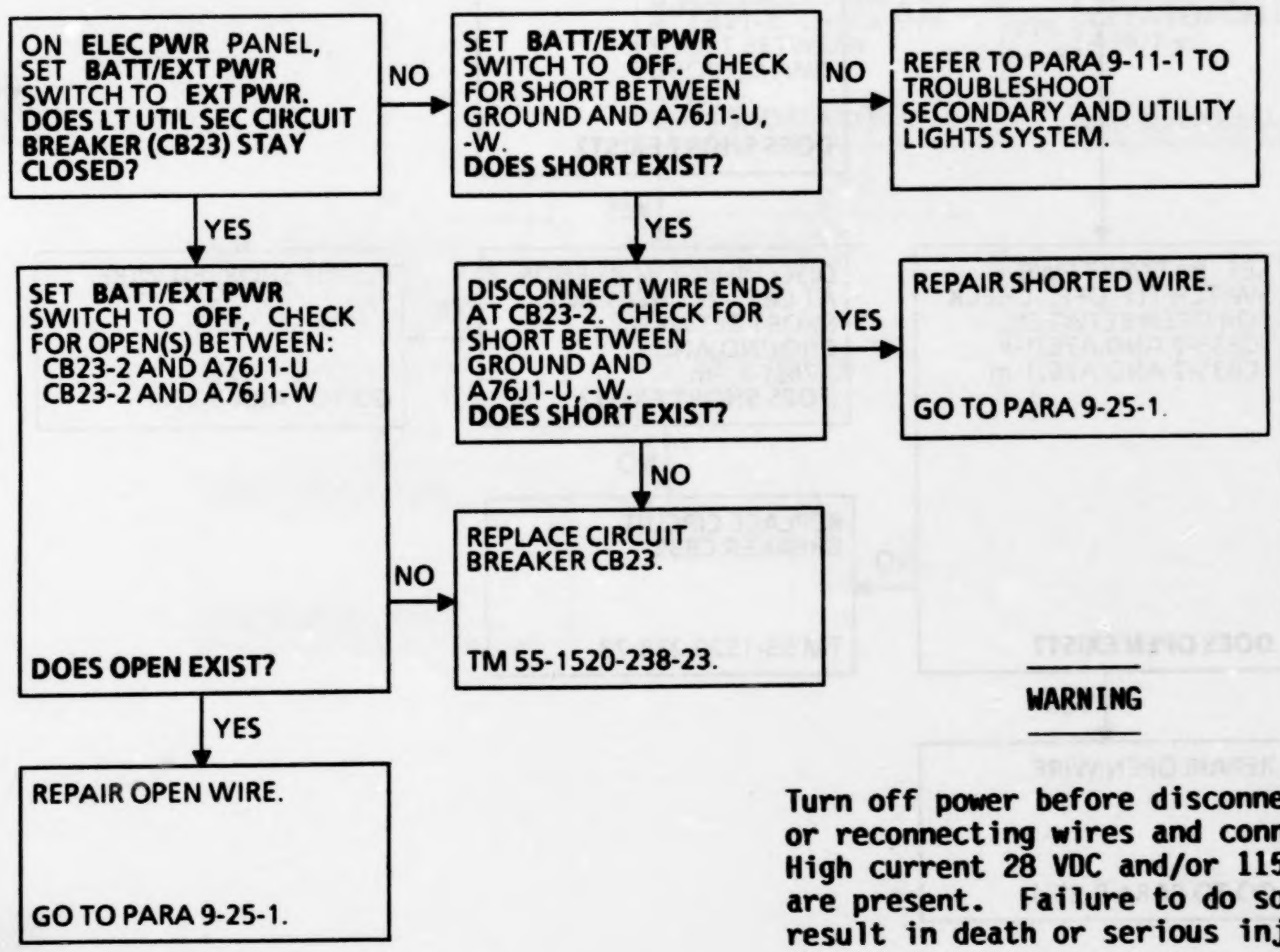
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT UTIL SEC CIRCUIT BREAKER (CB23) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-U, -W. DOES SHORT EXIST?
NO
REFER TO PARA 9-11-1 TO TROUBLESHOOT SECONDARY AND UTILITY LIGHTS SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN(S) BETWEEN: CB23-2 AND A76J1-U CB23-2 AND A76J1-W
DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB23-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-U, -W. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-25-1.
NO
NO
REPLACE CIRCUIT BREAKER CB23.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-29. LT SRCH/LDG CONT CIRCUIT BREAKER (CB80) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT AND CPG COLLECTIVE STICKS SEARCH LIGHT CONTROL IS NOT PRESENT AT A76J1-V

Tools: (para 9-25-28)

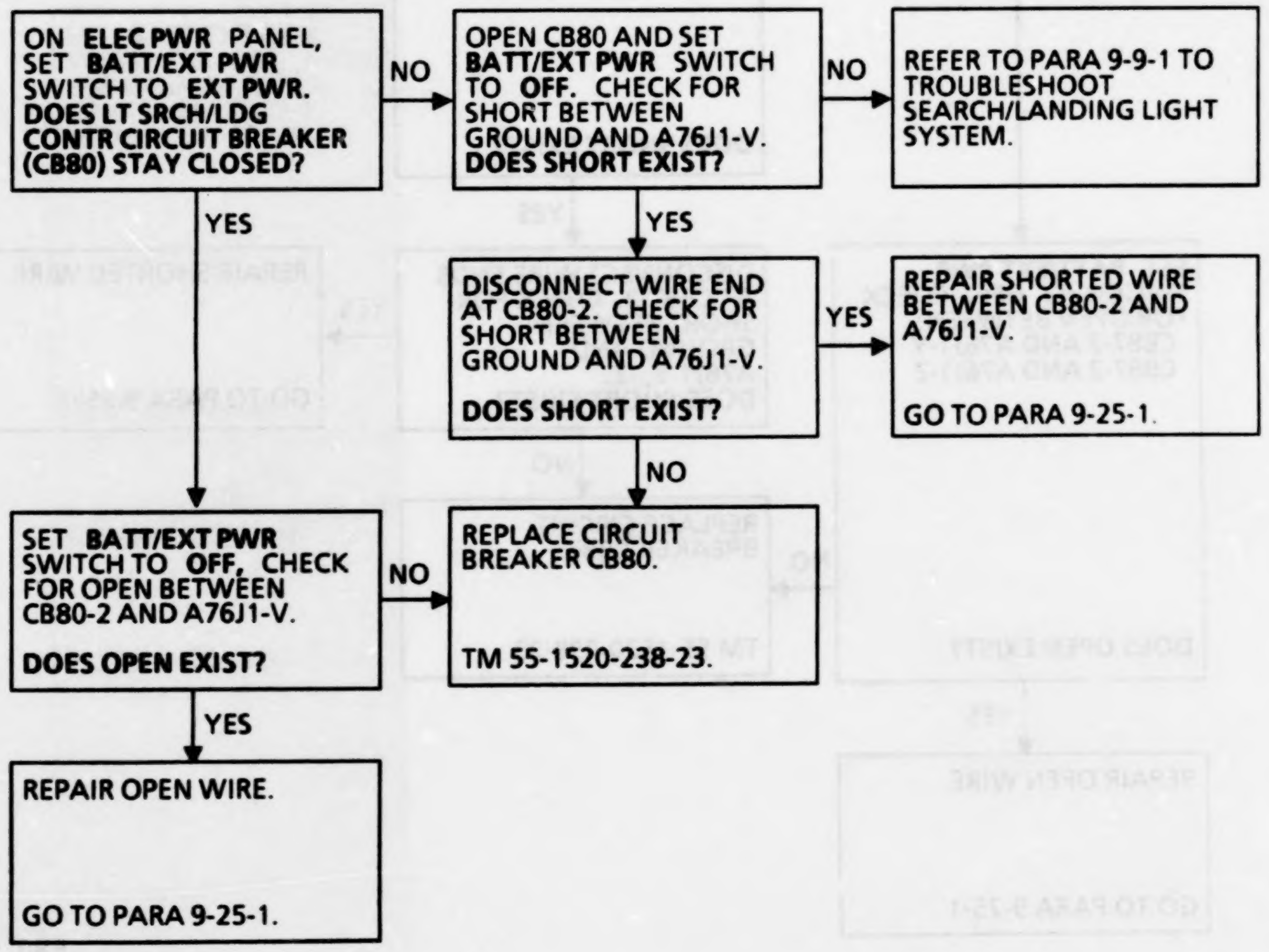
Personnel Required: (para 9-25-28)

References: (para 9-25-28)

Equipment Conditions: (para 9-25-28)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT SRCH/LDG CONTR CIRCUIT BREAKER (CB80) STAY CLOSED?
NO
OPEN CB80 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-V. DOES SHORT EXIST?
NO
REFER TO PARA 9-9-1 TO TROUBLESHOOT SEARCH/LANDING LIGHT SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB80-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-V. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB80-2 AND A76J1-V.
GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB80-2 AND A76J1-V. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB80.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-30. LT CAUT CIRCUIT BREAKER (CB21) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT MASTER AND CAUTION/WARNING PANELS IS NOT PRESENT AT A76J1-y

Tools: (para 9-25-28)

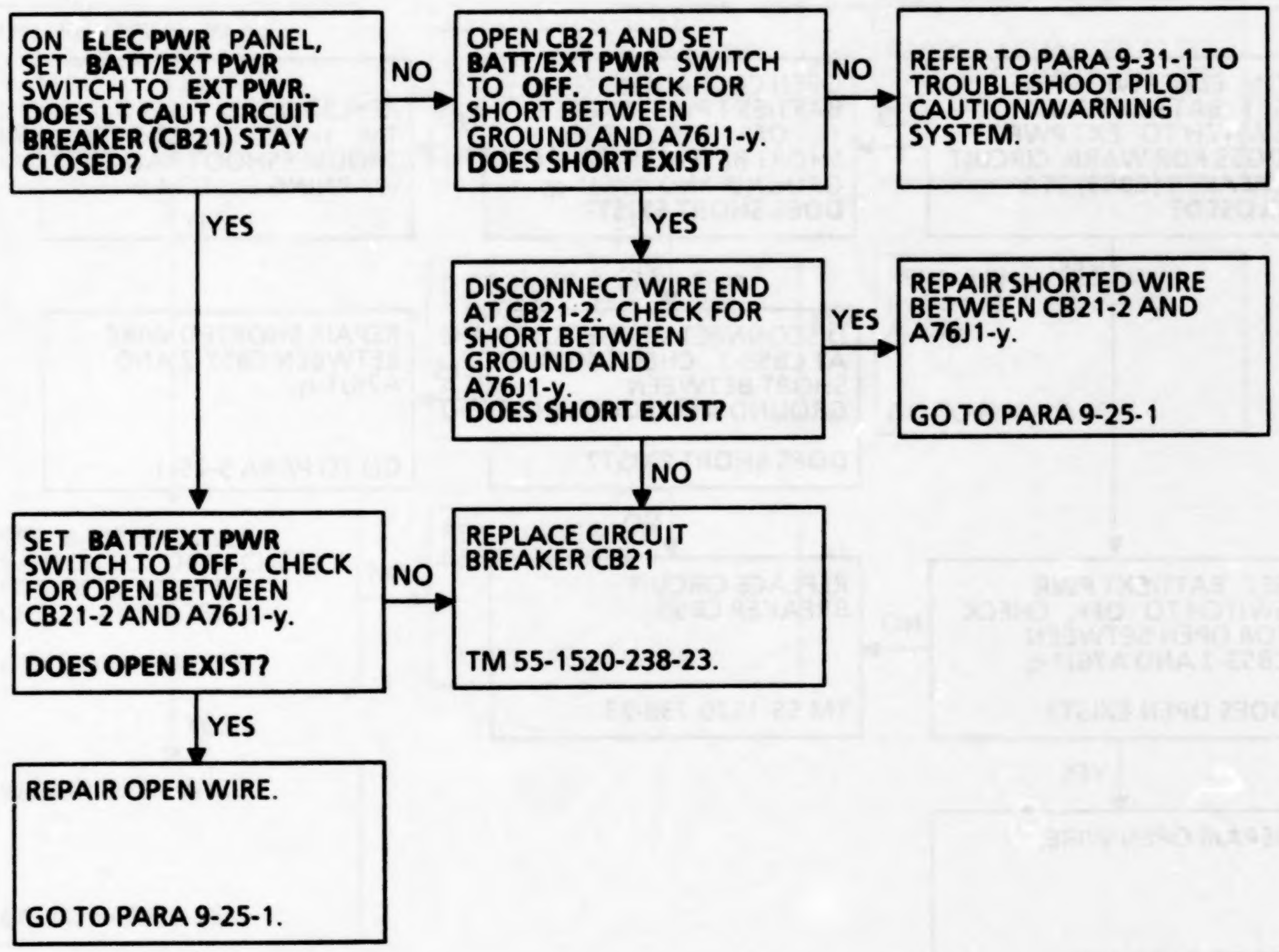
Personnel Required: (para 9-25-28)

References: (para 9-25-28)

Equipment Conditions: (para 9-25-28)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT CAUT CIRCUIT BREAKER (CB21) STAY CLOSED?
NO
OPEN CB21 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-y. DOES SHORT EXIST?
NO
REFER TO PARA 9-31-1 TO TROUBLESHOOT PILOT CAUTION/WARNING SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB21-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-y. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB21-2 AND A76J1-y.
GO TO PARA 9-25-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB21-2 AND A76J1-y.
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB21
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-31. CHAFF CIRCUIT BREAKER (CB46) - DOES NOT STAY CLOSED OR 28 VDC TO CHAFF DISPENSE CONTROL PANEL IS NOT PRESENT AT A76J1-t

Tools: (para 9-25-28)

Personnel Required: (para 9-25-28)

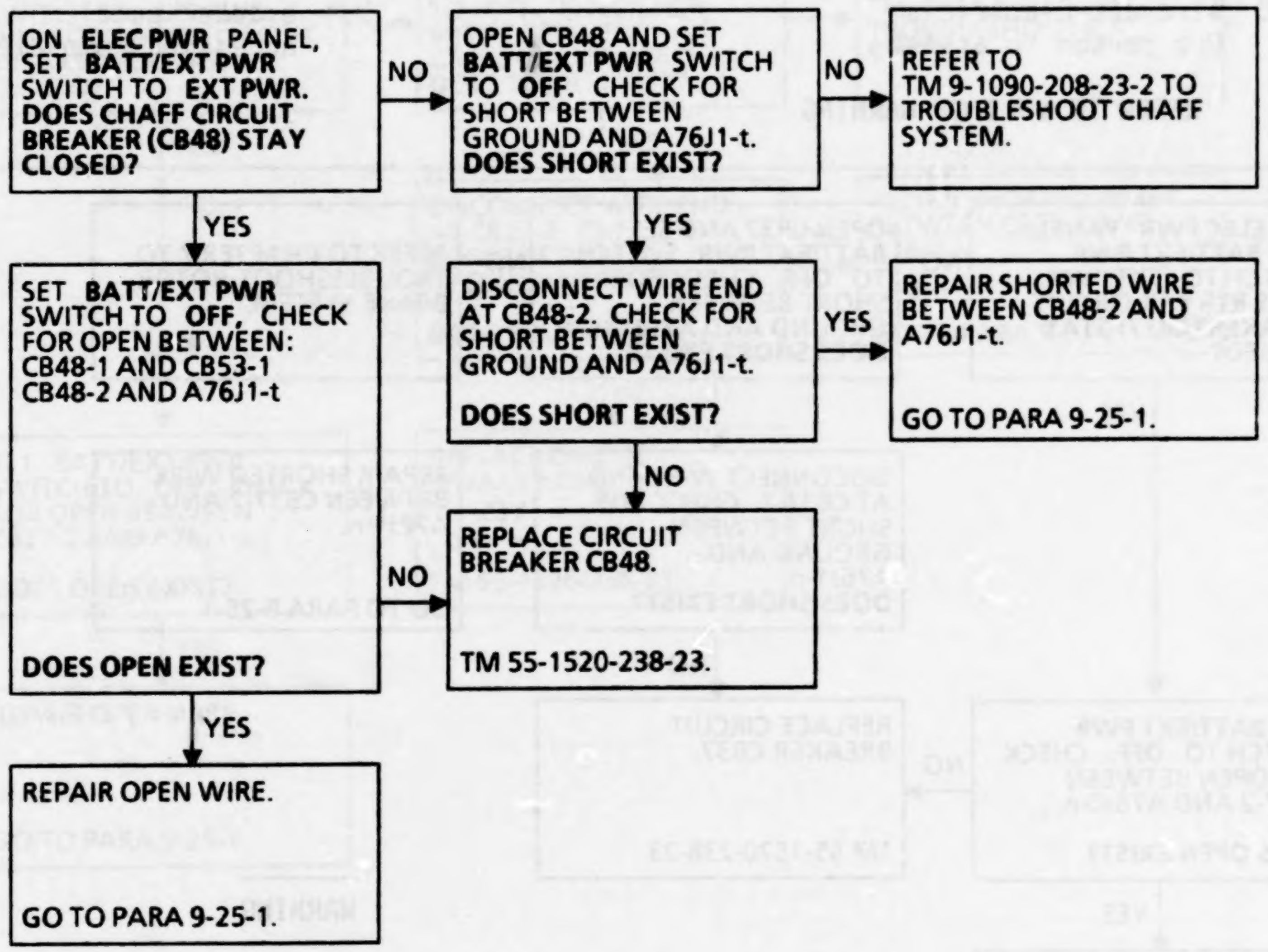
References:

TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions: (para 9-25-28)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES CHAFF CIRCUIT BREAKER (CB48) STAY CLOSED?
NO
OPEN CB48 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-t. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT CHAFF SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB48-1 AND CB53-1 CB48-2 AND A76J1-t
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB48-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-t.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB48-2 AND A76J1-t.
GO TO PARA 9-25-1.
NO
NO
REPLACE CIRCUIT BREAKER CB48.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-32. RTR BRK CIRCUIT BREAKER (CB37) - DOES NOT STAY CLOSED OR 28 VDC TO ROTOR BRAKE PRESSURE SWITCH IS NOT PRESENT AT A76J1-n

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

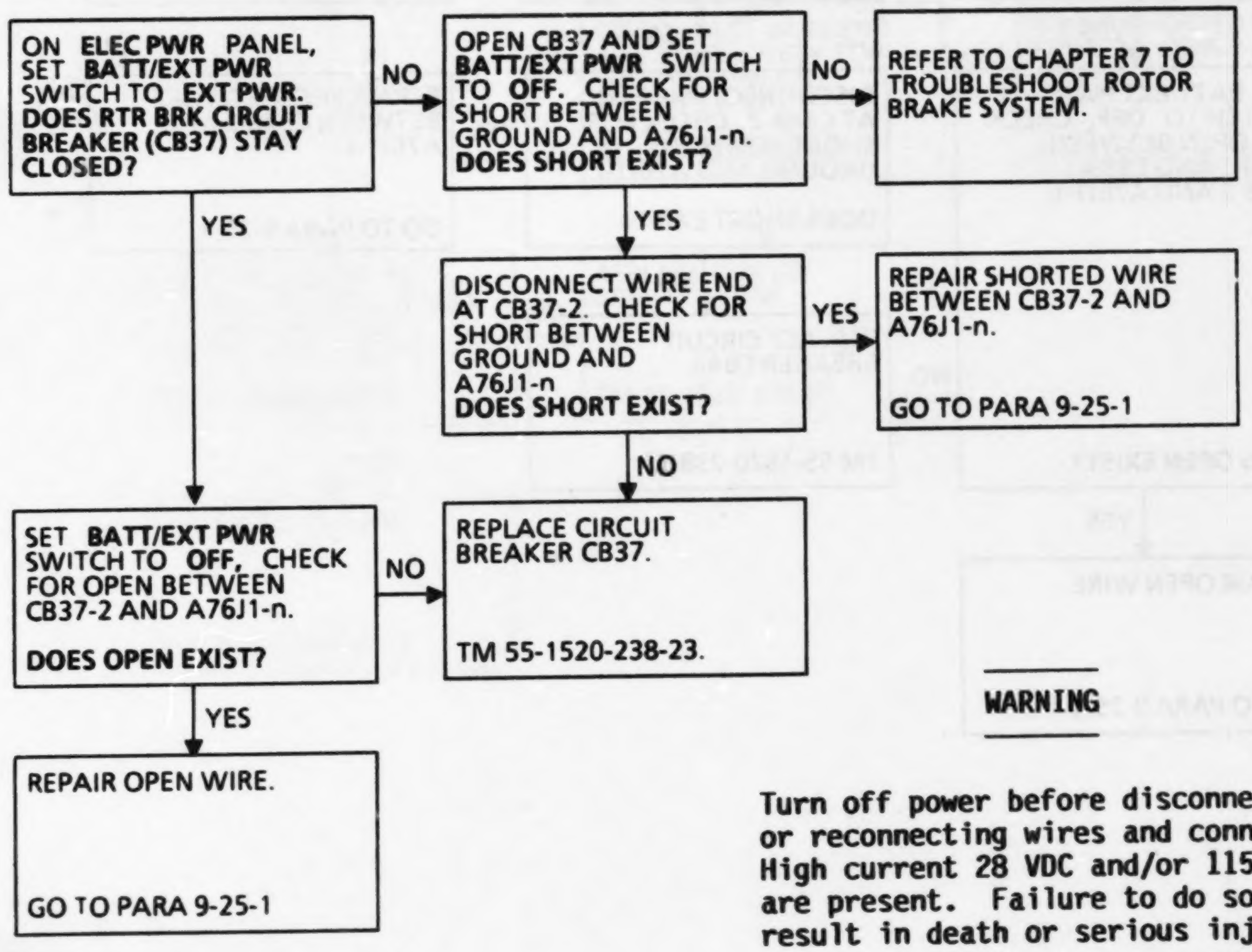
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES RTR BRK CIRCUIT BREAKER (CB37) STAY CLOSED?
NO
YES
OPEN CB37 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-n. DOES SHORT EXIST?
NO
REFER TO CHAPTER 7 TO TROUBLESHOOT ROTOR BRAKE SYSTEM.
YES
DISCONNECT WIRE END AT CB37-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-n DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB37-2 AND A76J1-n.
GO TO PARA 9-25-1
NO
REPLACE CIRCUIT BREAKER CB37.
TM 55-1520-238-23.
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB37-2 AND A76J1-n.
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-33. RDR WARN CIRCUIT BREAKER (CB53) - DOES NOT STAY CLOSED OR 28 VDC TO RADAR WARNING DETECTING SET CONTROL IS NOT PRESENT AT A76J1-q

Tools: (para 9-25-32)

Personnel Required: (para 9-25-32)

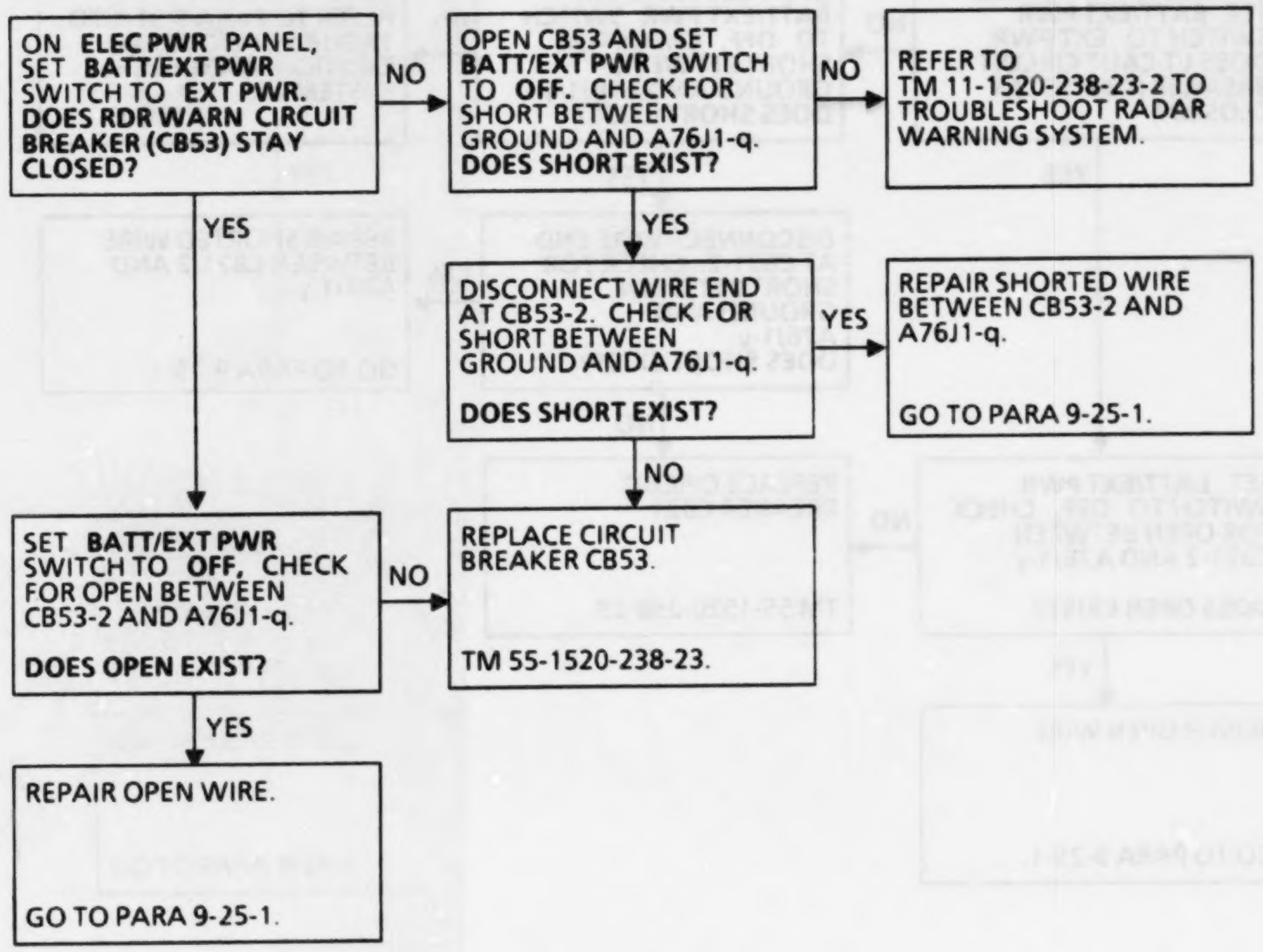
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions: (para 9-25-32)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES RDR WARN CIRCUIT BREAKER (CB53) STAY CLOSED?
NO
YES
OPEN CB53 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-q. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT RADAR WARNING SYSTEM.
YES
DISCONNECT WIRE END AT CB53-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-q.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB53-2 AND A76J1-q.
GO TO PARA 9-25-1.
NO
REPLACE CIRCUIT BREAKER CB53.
TM 55-1520-238-23.
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB53-2 AND A76J1-q.
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-34. PITOT HTR CIRCUIT BREAKER (CB36) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT ANTI ICE PANEL IS NOT PRESENT AT A76J1-s

Tools: (para 9-25-32)

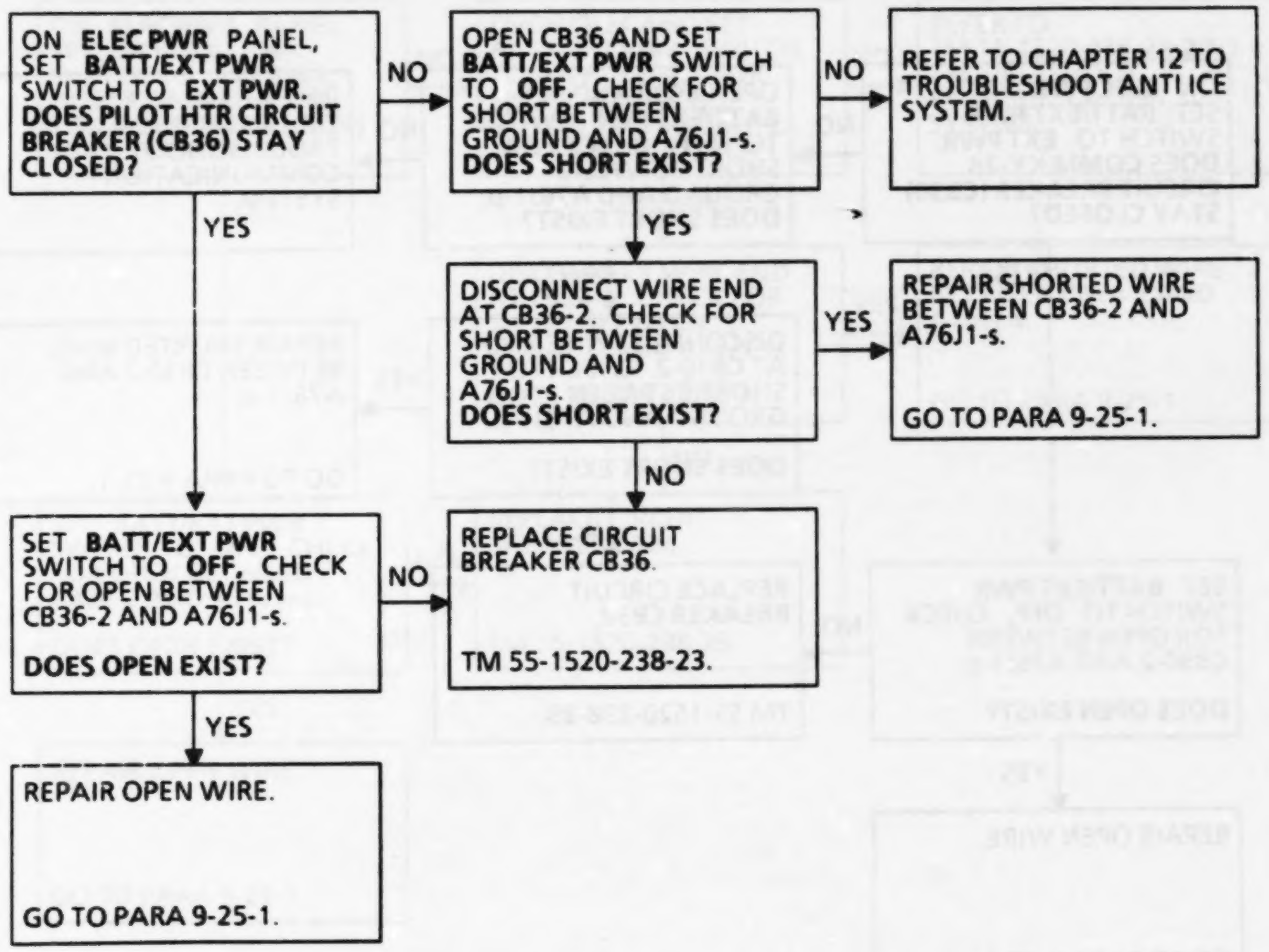
Personnel Required: (para 9-25-32)

References: (para 9-25-32)

Equipment Conditions: (para 9-25-32)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES PILOT HTR CIRCUIT BREAKER (CB36) STAY CLOSED?
NO
OPEN CB36 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-s. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI ICE SYSTEM.
YES
DISCONNECT WIRE END AT CB36-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-s. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB36-2 AND A76J1-s.
GO TO PARA 9-25-1.
NO
REPLACE CIRCUIT BREAKER CB36.
TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB36-2 AND A76J1-s.
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-35. COMM ICS CIRCUIT BREAKER (CB27) - DOES NOT STAY CLOSED OR 28 VDC TO AUDIO JUNCTION UNIT IS NOT PRESENT AT A76J1-a

Tools: (para 9-25-32)

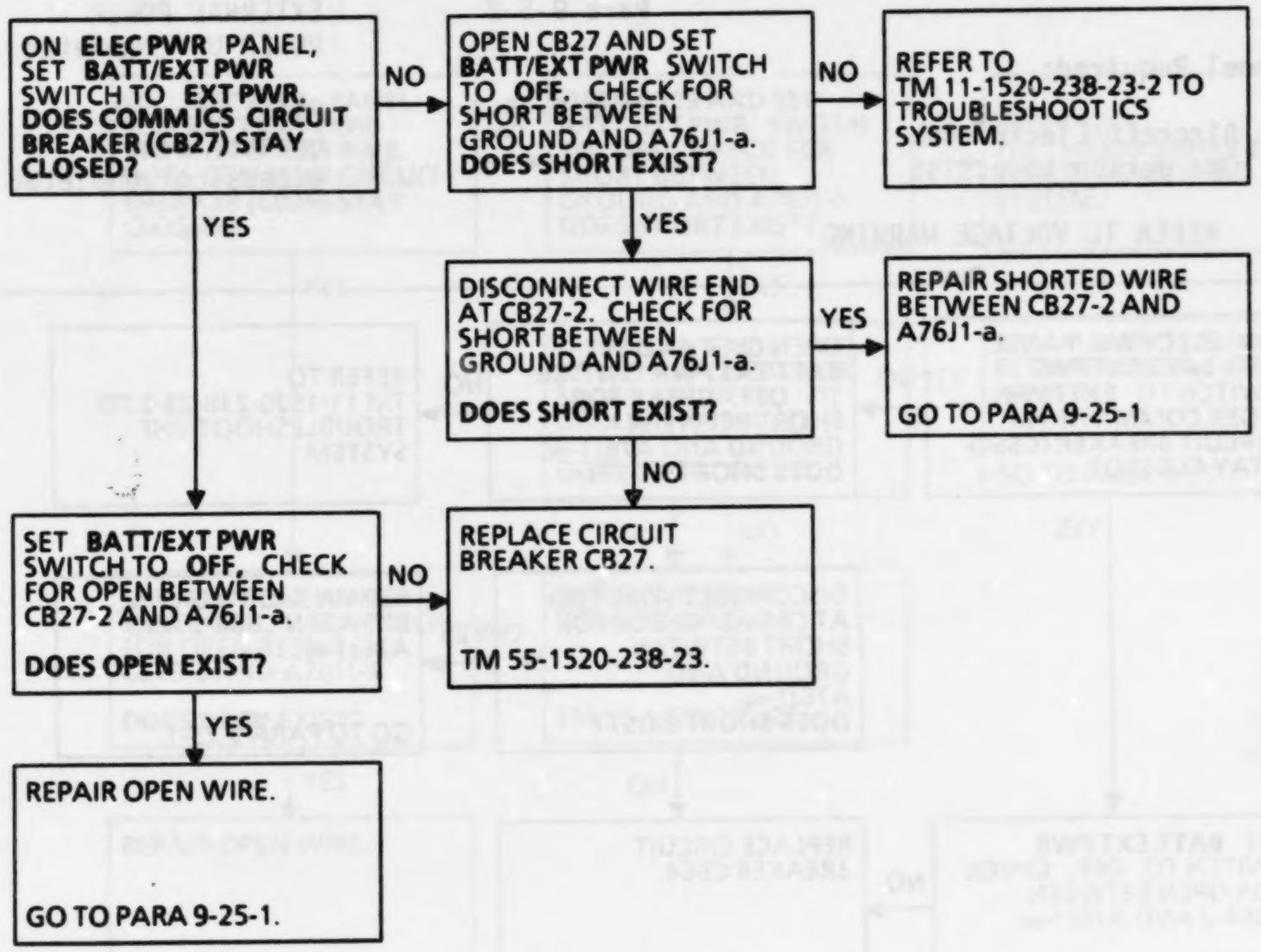
Personnel Required: (para 9-25-32)

References: (para 9-25-32)

Equipment Conditions: (para 9-25-32)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES COMM ICS CIRCUIT BREAKER (CB27) STAY CLOSED?
NO
OPEN CB27 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-a. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT ICS SYSTEM.
YES
DISCONNECT WIRE END AT CB27-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-a. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB27-2 AND A76J1-a.
GO TO PARA 9-25-1
NO
REPLACE CIRCUIT BREAKER CB27.
TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB27-2 AND A76J1-a.
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-36. COMM VHF FM CIRCUIT BREAKER (CB64) - DOES NOT STAY CLOSED OR 28 VDC TO PHASE FRONT HOMING MODULE IS NOT PRESENT AT A76J1-w

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

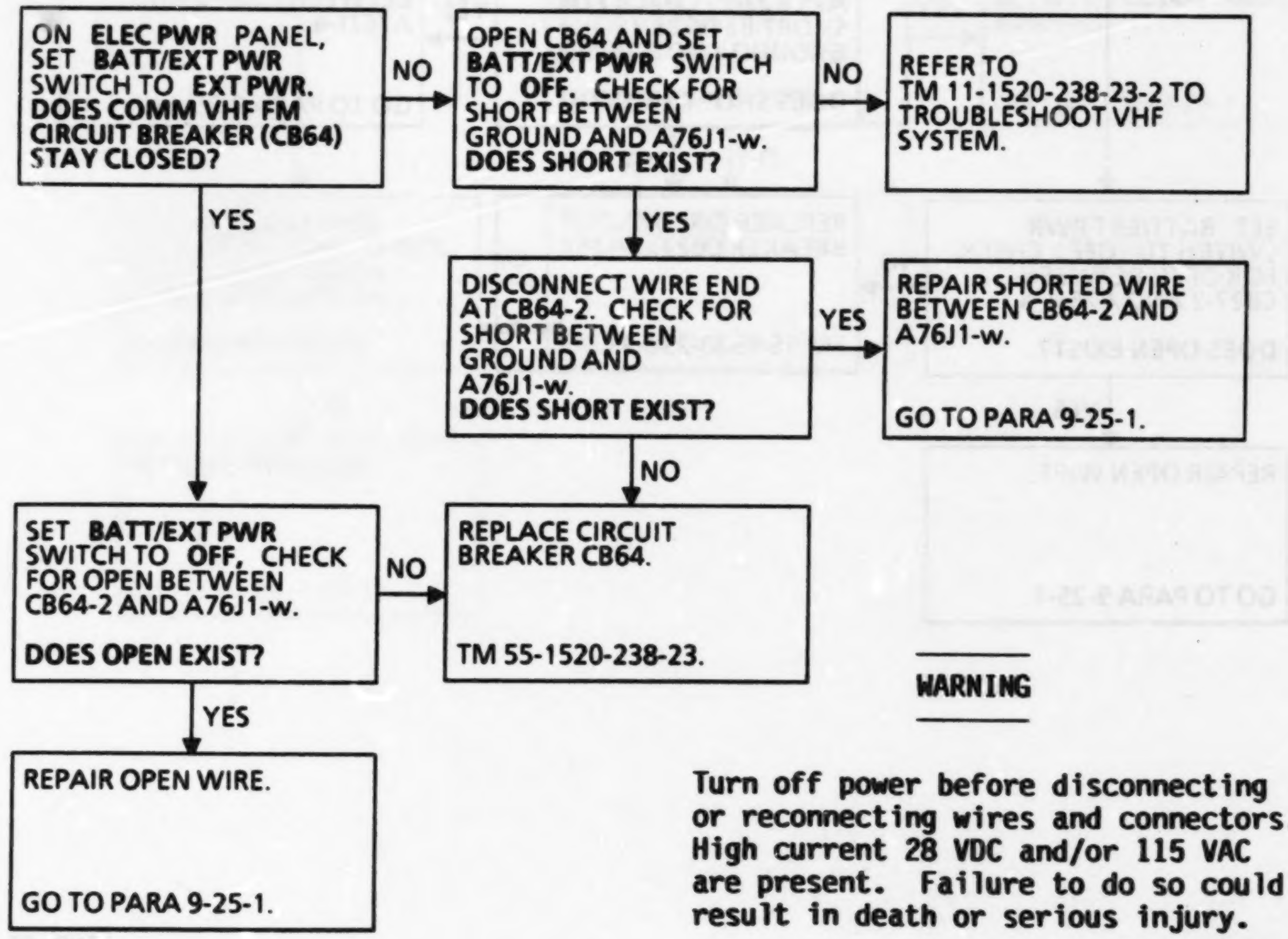
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES COMM VHF FM CIRCUIT BREAKER (CB64) STAY CLOSED?**

OPEN CB64 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-w. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT VHF SYSTEM.

DISCONNECT WIRE END AT CB64-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-w. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE BETWEEN CB64-2 AND A76J1-w.

GO TO PARA 9-25-1.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN CB64-2 AND A76J1-w.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB64.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-37. COMM KY-28 CIRCUIT BREAKER (CB30) - DOES NOT STAY CLOSED OR 28 VDC TO SECURE VOICE CONTROL PANEL IS NOT PRESENT AT A76J1-p

Tools: (para 9-25-36)

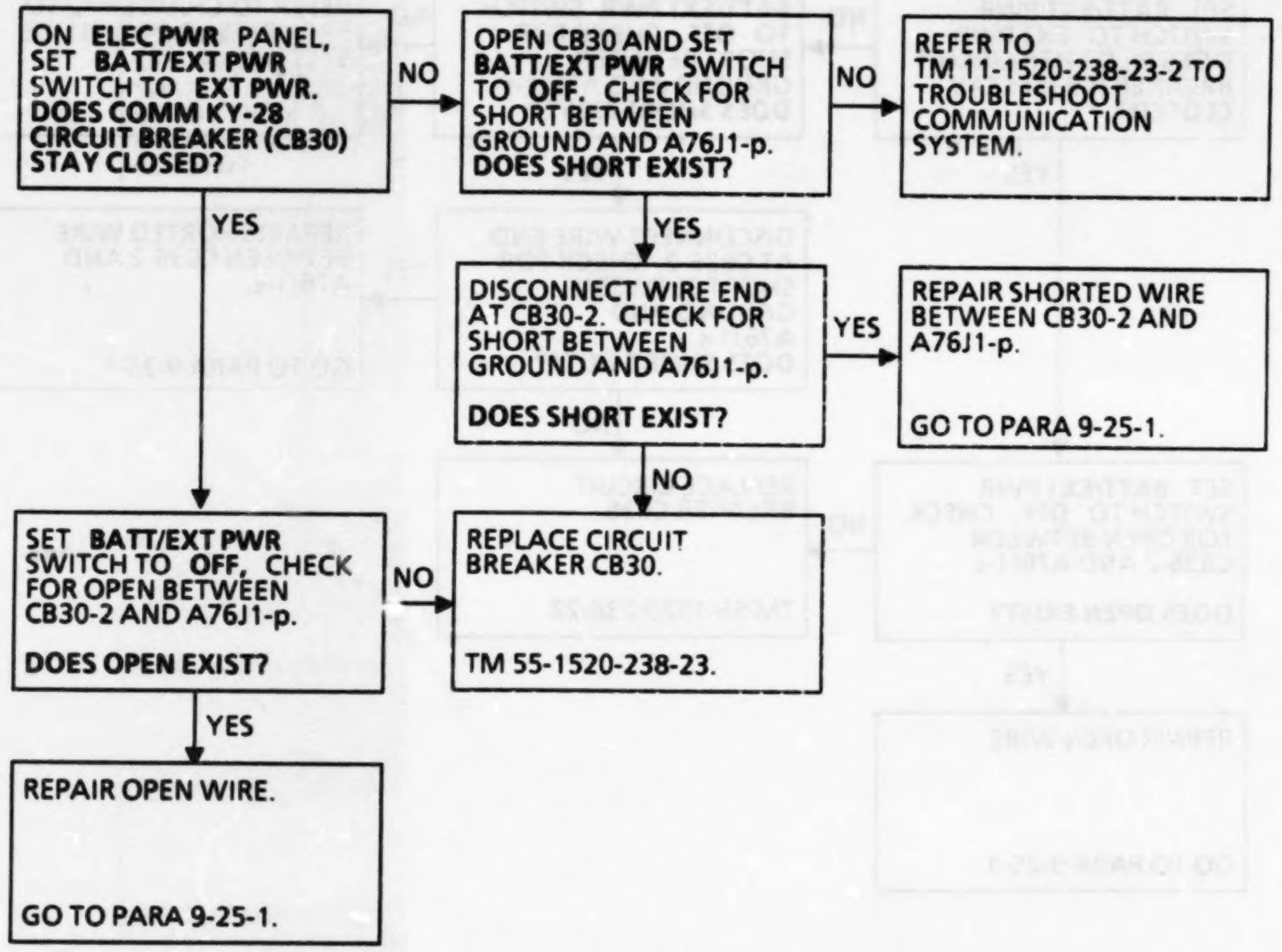
Personnel Required: (para 9-25-36)

References: (para 9-25-36)

Equipment Conditions: (para 9-25-36)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES COMM KY-28 CIRCUIT BREAKER (CB30) STAY CLOSED?**

OPEN CB30 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-p. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT COMMUNICATION SYSTEM.

DISCONNECT WIRE END AT CB30-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-p.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB30-2 AND A76J1-p.

GO TO PARA 9-25-1.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN CB30-2 AND A76J1-p.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB30.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

END OF TASK

9-25-38. COMM UHF AM CIRCUIT BREAKER (CB24) - DOES NOT STAY CLOSED OR 28 VDC TO UHF-AM RADIO CONTROL PANEL IS NOT PRESENT AT A76J1-v

Tools: (para 9-25-36)

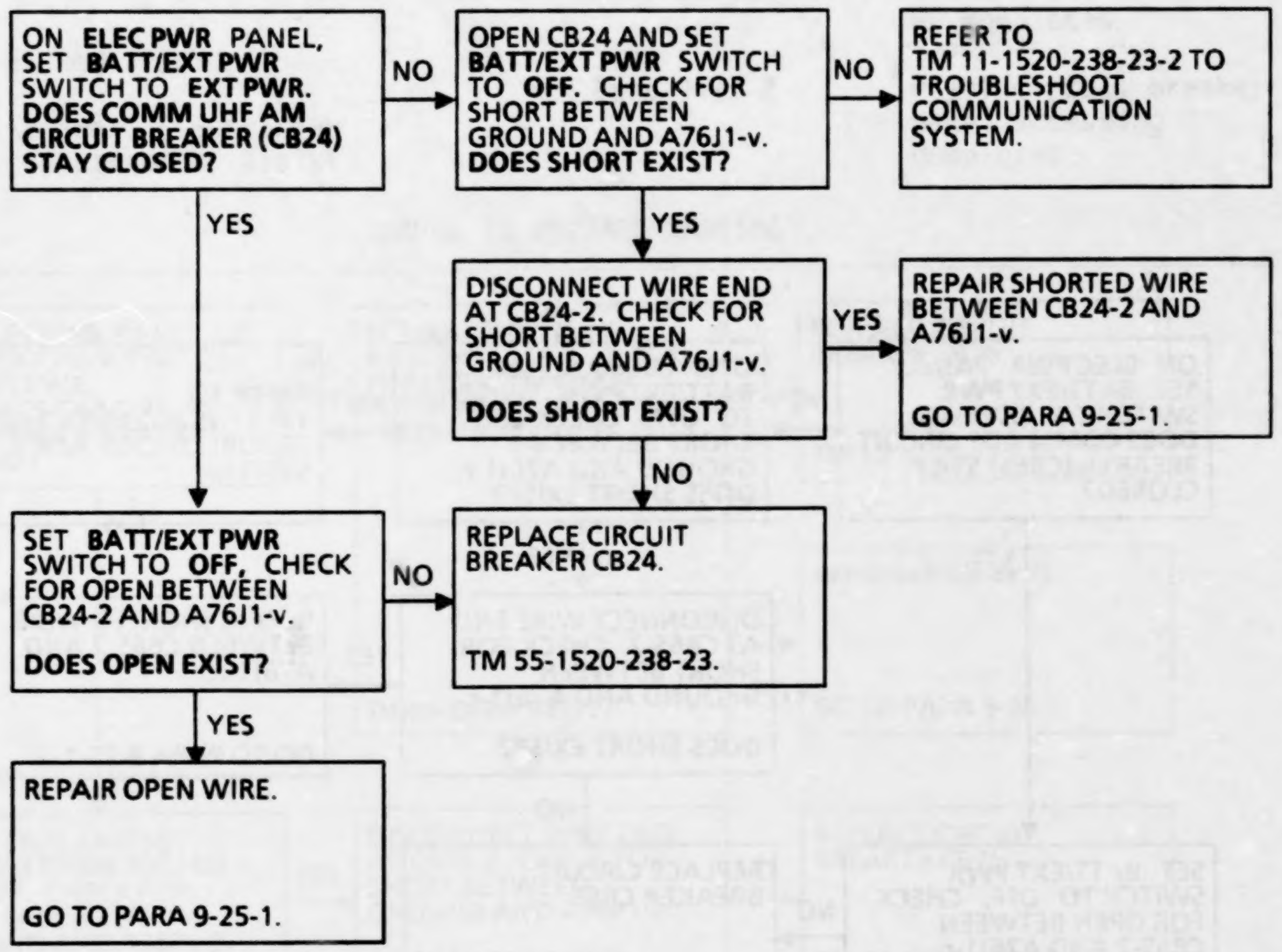
Personnel Required: (para 9-25-36)

References: (para 9-25-36)

Equipment Conditions: (para 9-25-36)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES COMM UHF AM CIRCUIT BREAKER (CB24) STAY CLOSED?
NO
OPEN CB24 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-v. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT COMMUNICATION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB24-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-v. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB24-2 AND A76J1-v. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB24-2 AND A76J1-v. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB24. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-39. COMM IFF CIRCUIT BREAKER (CB29) - DOES NOT STAY CLOSED OR 28 VDC TO IFF RECEIVER TRANSMITTER IS NOT PRESENT AT A76J1-S

Tools: (para 9-25-36)

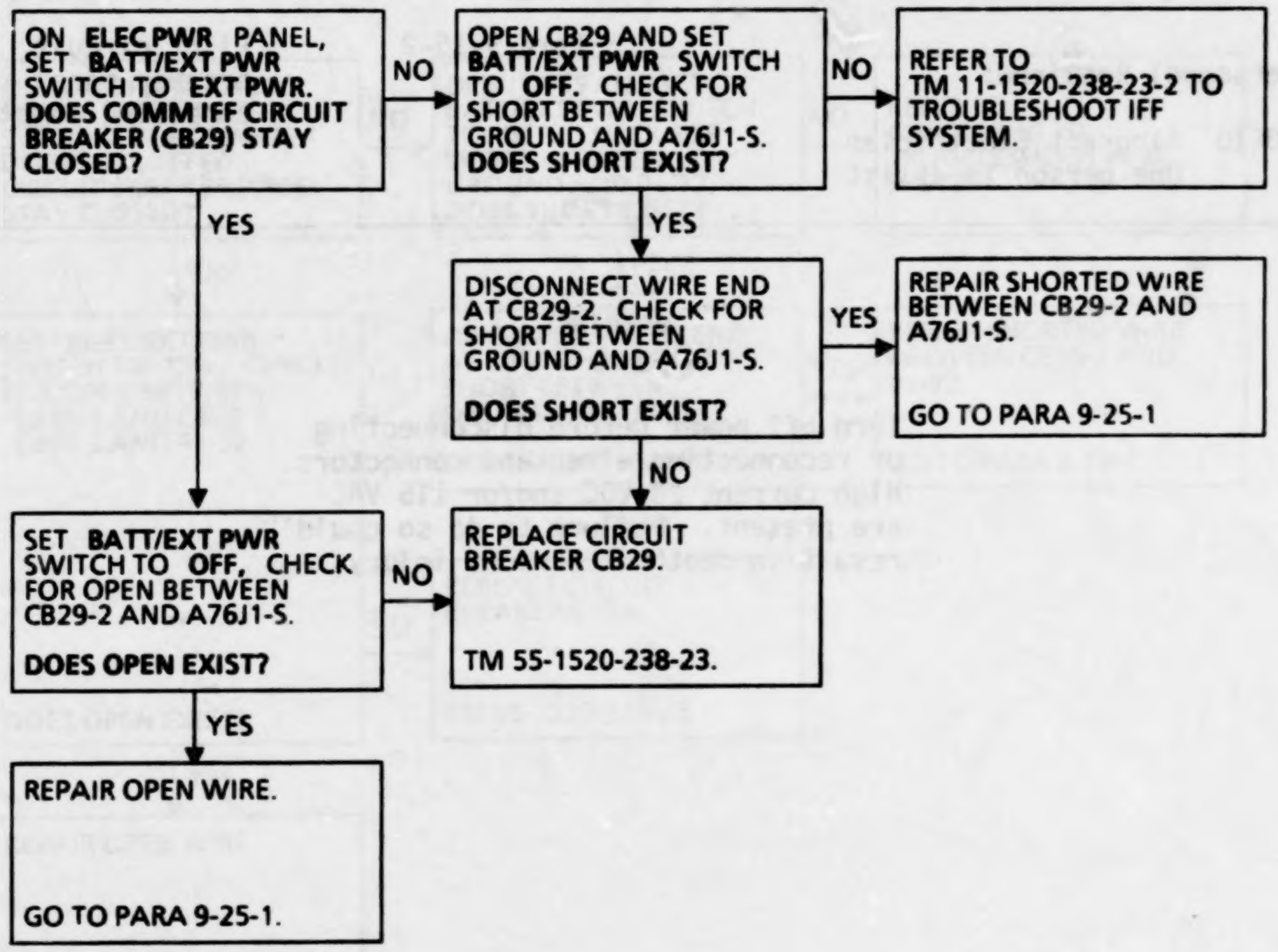
Personnel Required: (para 9-25-36)

References: (para 9-25-36)

Equipment Conditions: (para 9-25-36)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES COMM IFF CIRCUIT BREAKER (CB29) STAY CLOSED?
NO
OPEN CB29 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-S. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT IFF SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB29-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-S. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB29-2 AND A76J1-S. GO TO PARA 9-25-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB29-2 AND A76J1-S. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB29. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-40. COMM ADF CIRCUIT BREAKER (CB65) - DOES NOT STAY CLOSED OR 28 VDC TO DIRECTION FINDER RECEIVER IS NOT PRESENT AT A76J1-r

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

63F10 Aircraft Electrician
One person to assist

References:

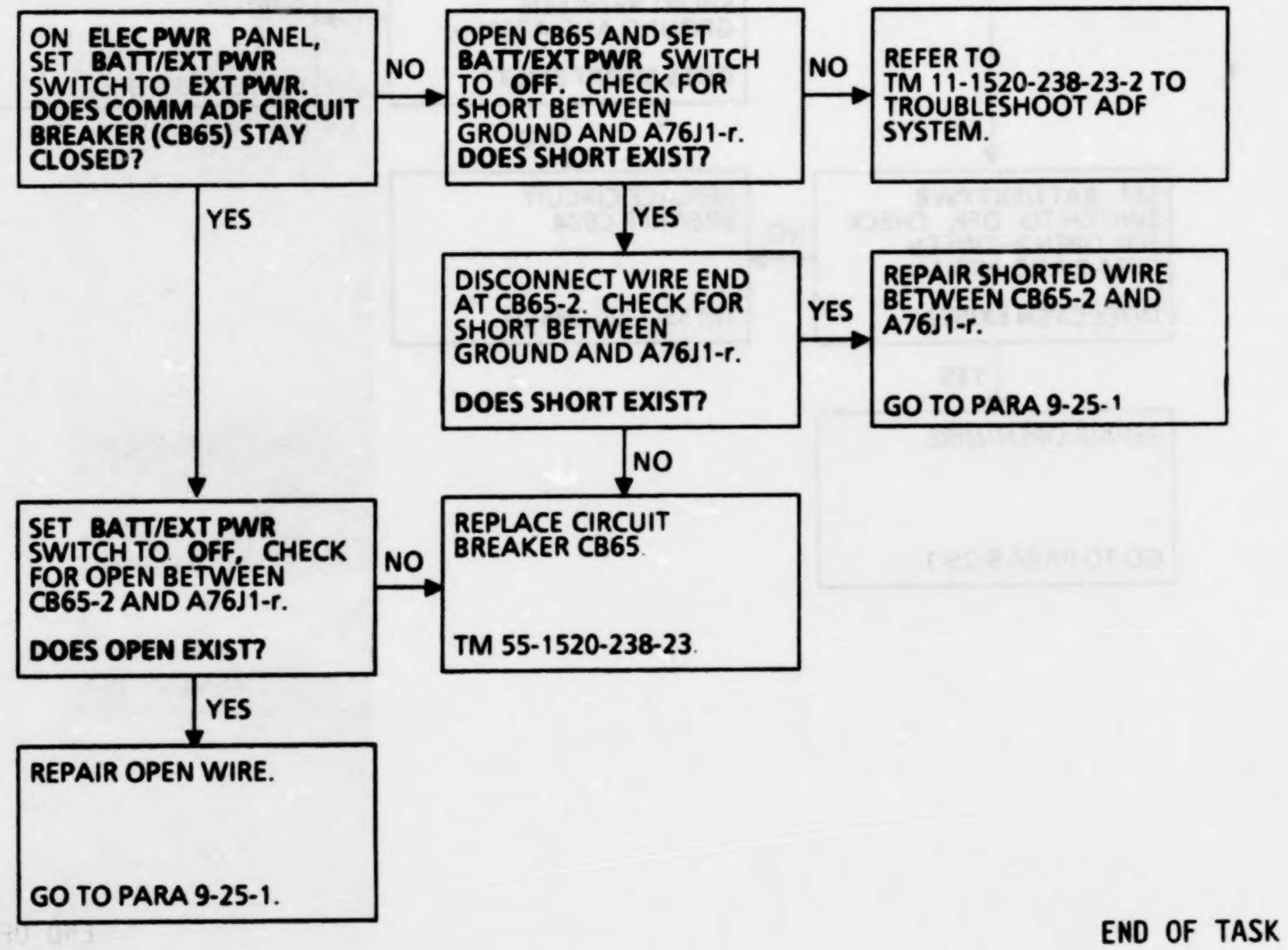
TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES COMM ADF CIRCUIT BREAKER (CB65) STAY CLOSED?

OPEN CB65 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-r. DOES SHORT EXIST?

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT ADF SYSTEM.

DISCONNECT WIRE END AT CB65-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-r. DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB65-2 AND A76J1-r. GO TO PARA 9-25-1

REPLACE CIRCUIT BREAKER CB65. TM 55-1520-238-23.

SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB65-2 AND A76J1-r. DOES OPEN EXIST?

REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-41. ECS CAB CIRCUIT BREAKER (CB76) - DOES NOT STAY CLOSED OR 28 VDC TO AUX PANEL IS NOT PRESENT AT A76P1-2

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

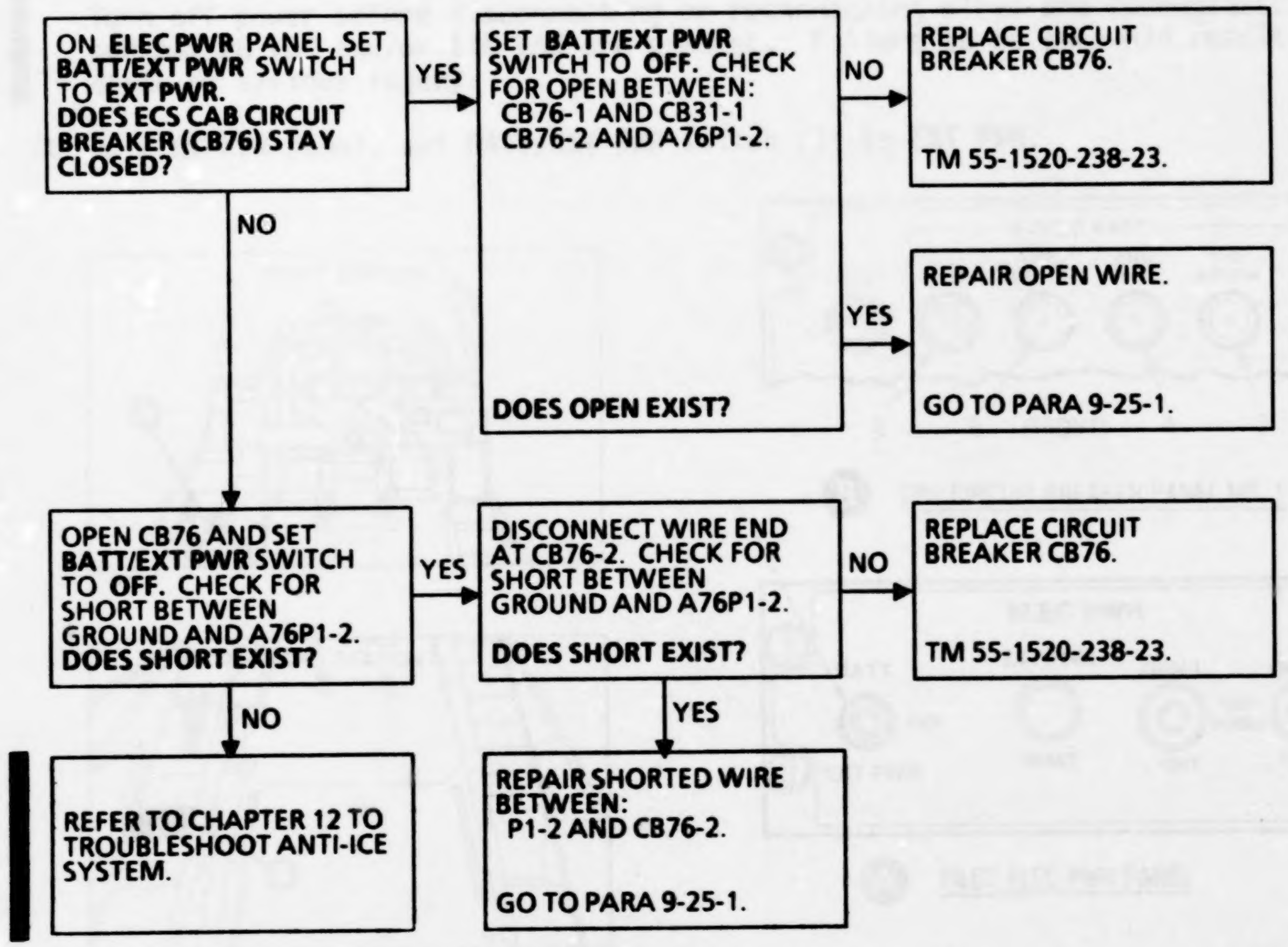
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS CAB CIRCUIT BREAKER (CB76) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB76-1 AND CB31-1 CB76-2 AND A76P1-2.
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB76.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.
NO
OPEN CB76 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-2. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB76-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-2.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB76.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN: P1-2 AND CB76-2.
GO TO PARA 9-25-1.
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI-ICE SYSTEM.

END OF TASK

9-25-42. FUEL XFEED CIRCUIT BREAKER (CB55) - DOES NOT STAY CLOSED OR 28 VDC TO ENGINE 1 AND 2 FUEL VALVE ACTUATORS IS NOT PRESENT AT P1-32

Tools: (para 9-25-41)

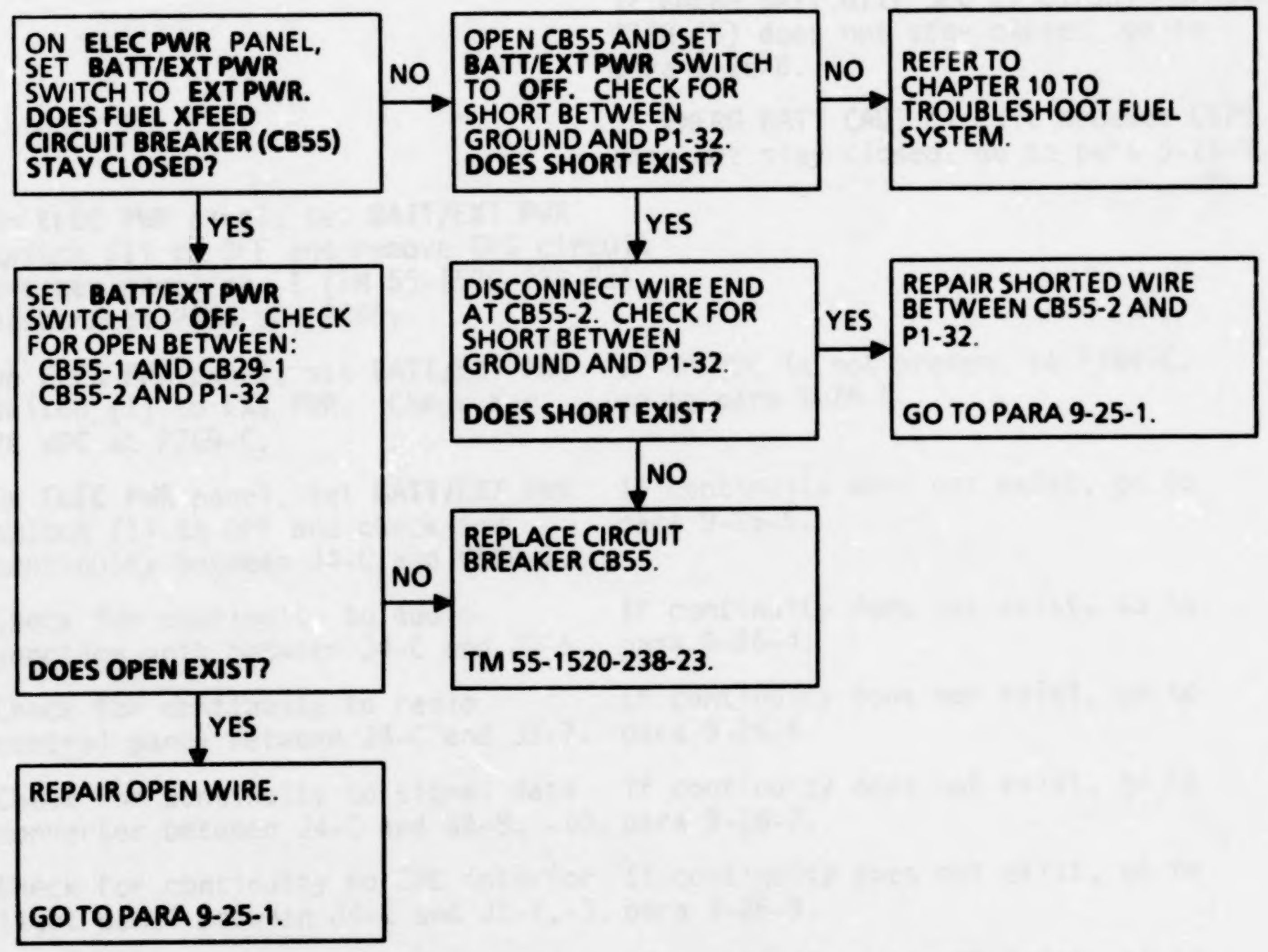
Personnel Required: (para 9-25-41)

References: (para 9-25-41)

Equipment Conditions: (para 9-25-41)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FUEL XFEED CIRCUIT BREAKER (CB55) STAY CLOSED?
NO
OPEN CB55 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-32. DOES SHORT EXIST?
NO
REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB55-1 AND CB29-1 CB55-2 AND P1-32
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB55-2. CHECK FOR SHORT BETWEEN GROUND AND P1-32.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB55-2 AND P1-32.
GO TO PARA 9-25-1.
NO
REPLACE CIRCUIT BREAKER CB55.
TM 55-1520-238-23.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

9-26-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - CPG STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

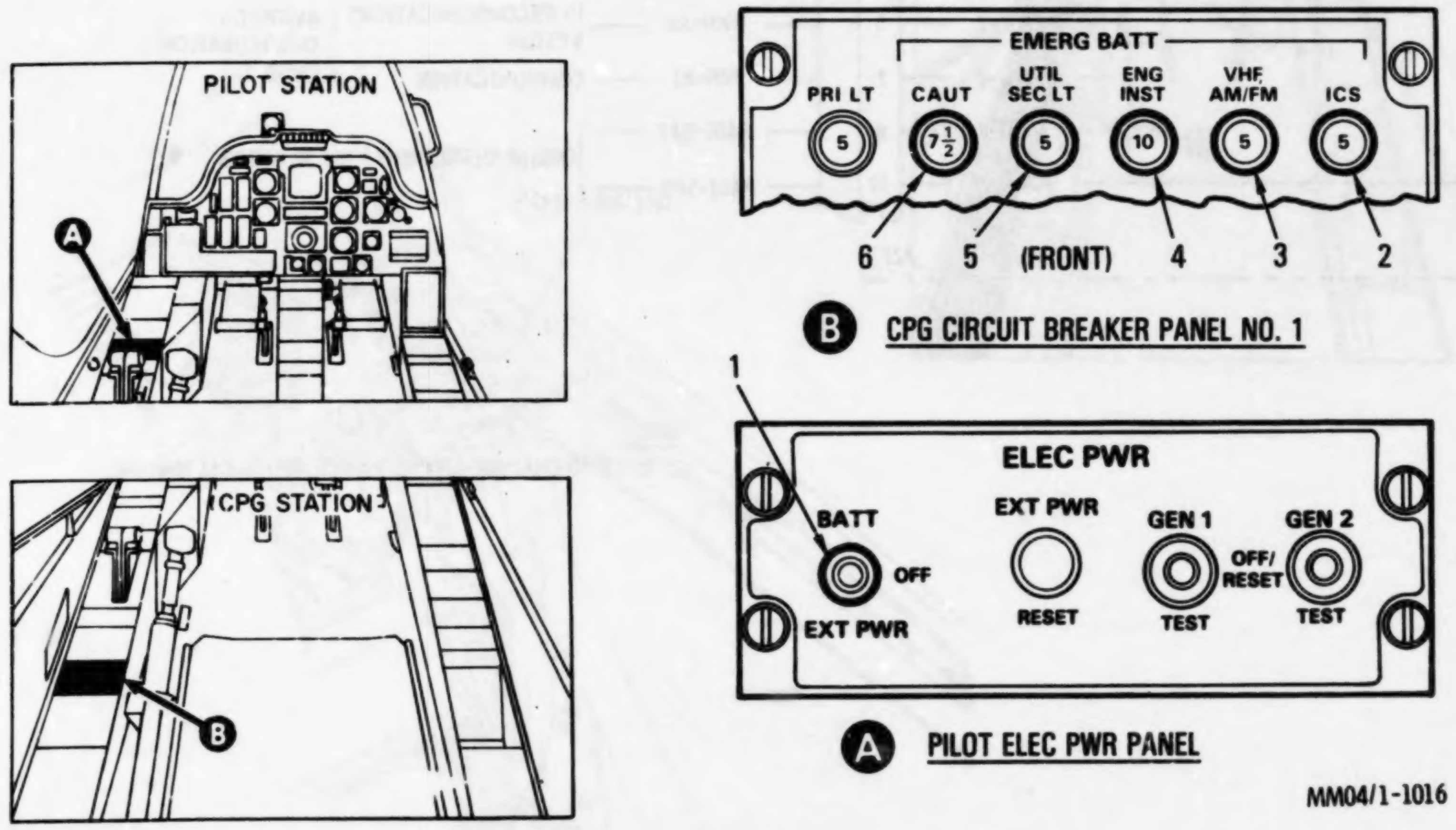
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

A. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**



Ⓑ CPG CIRCUIT BREAKER PANEL NO. 1

Ⓐ PILOT ELEC PWR PANEL

MM04/1-1016

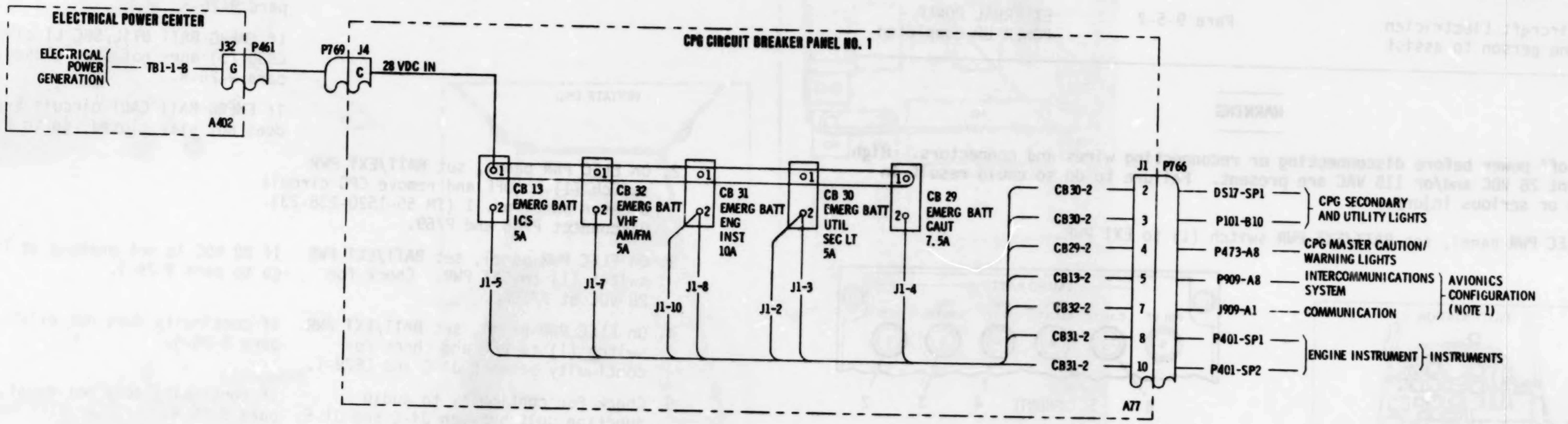
B. Complete operational check as follows:

TASK	RESULT
1. Close all CPG DC emergency circuit breakers.	If **EMERG BATT ICS** CB13 (2) does not stay closed, go to para 9-26-4. If **EMERG BATT VHF AM/FM** circuit breaker CB32 (3) does not stay closed, go to para 9-26-6. If **EMERG BATT ENG INST** circuit breaker CB31 (4) does not stay closed, go to para 9-26-7. If **EMERG BATT UTIL SEC LT** circuit breaker CB30 (5) does not stay closed, go to para 9-26-8. If **EMERG BATT CAUT** circuit breaker CB29 (6) does not stay closed, go to para 9-26-9.
2. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to OFF and remove CPG circuit breaker panel no. 1 (TM 55-1520-238-23). Disconnect P766 and P769.	
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.** Check for 28 VDC at P769-C.	If 28 VDC is not present at P769-C, go to para 9-26-5.
4. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to OFF and check for continuity between J4-C and CB29-1.	If continuity does not exist, go to para 9-26-5.
5. Check for continuity to audio junction unit between J4-C and J1-5.	If continuity does not exist, go to para 9-26-4.
6. Check for continuity to radio control panel between J4-C and J1-7.	If continuity does not exist, go to para 9-26-6.
7. Check for continuity to signal data converter between J4-C and J1-8, -10.	If continuity does not exist, go to para 9-26-7.
8. Check for continuity to CPG interior light panel between J4-C and J1-2,-3.	If continuity does not exist, go to para 9-26-9.
9. Check for continuity to master and caution/warning panels between J4-C and J1-4.	If continuity does not exist, go to para 9-26-9.

C. Reinstall CPG circuit breaker panel No. 1 (TM 55-1520-238-23).
D. Reconnect P766 and P769.
E. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-26-2. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - CPG STATION) - INTERCONNECTION DIAGRAM

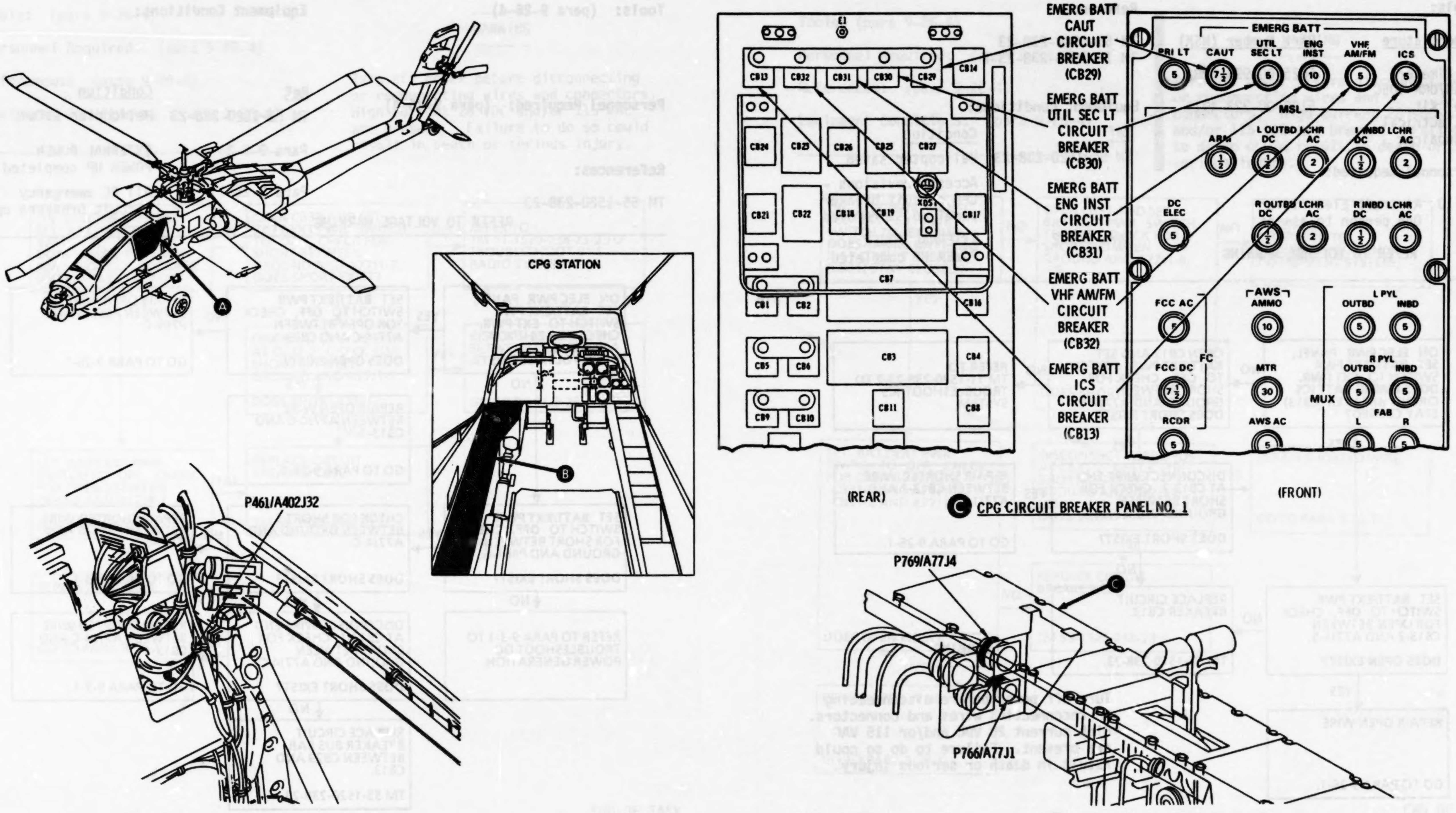

ELECTRICAL POWER CENTER
ELECTRICAL POWER GENERATION
TB1-1-B
J32
P461
G
A402
P769
J4
C
28 VDC IN
CPG CIRCUIT BREAKER PANEL NO. 1
CB 13 EMERG BATT ICS 5A
CB 32 EMERG BATT VHF AM/FM 5A
CB 31 EMERG BATT ENG INST 10A
CB 30 EMERG BATT UTIL SEC LT 5A
CB 29 EMERG BATT CAUT 7.5A
J1-5
J1-7
J1-10
J1-8
J1-2
J1-3
J1-4
J1
P766
CB30-2
CB30-2
CB29-2
CB13-2
CB32-2
CB31-2
CB31-2
2
3
4
5
7
8
10
A77
DS17-SP1
P101-B10
P473-A8
P909-A8
J909-A1
P401-SP1
P401-SP2
CPG SECONDARY AND UTILITY LIGHTS
CPG MASTER CAUTION/ WARNING LIGHTS
INTERCOMMUNICATIONS SYSTEM
COMMUNICATION
AVIONICS CONFIGURATION (NOTE 1)
ENGINE INSTRUMENT
INSTRUMENTS

NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-769A

9-26-3. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - CPG STATION) ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
CPG STATION
B
P461/A402J32
E1
CB13
CB32
CB31
CB30
CB29
CB14
CB24
CB23
CB26
CB25
CB27
CB21
CB22
CB18
CB19
XDS1
CB17
CB7
CB1
CB2
CB16
CB5
CB6
CB3
CB4
CB9
CB10
CB11
CB8
EMERG BATT CAUT CIRCUIT BREAKER (CB29)
EMERG BATT UTIL SEC LT CIRCUIT BREAKER (CB30)
EMERG BATT ENG INST CIRCUIT BREAKER (CB31)
EMERG BATT VHF AM/FM CIRCUIT BREAKER (CB32)
EMERG BATT ICS CIRCUIT BREAKER (CB13)
EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7 1/2
5
10
5
5
MSL
ARM
L OUTBD LCHR DC
AC
L INBD LCHR DC
AC
1/2
1/2
2
1/2
2
DC ELEC
5
R OUTBD LCHR DC
AC
R INBD LCHR DC
AC
1/2
2
1/2
2
FCC AC
5
FC
FCC DC
7 1/2
RCDR
5
AWS
AMMO
10
MTR
30
AWS AC
5
MUX
L PYL
OUTBD
INBD
5
5
R PYL
OUTBD
INBD
5
5
FAB
L
R
5
5
(REAR)
(FRONT)
P769/A77J4
C
P766/A77J1

A PILOT STATION (LEFT CONSOLE)

C CPG CIRCUIT BREAKER PANEL NO. 1

B CPG STATION LEFT CONSOLE

MM04/1-1193B

9-26-4. EMERG BATT ICS CIRCUIT BREAKER (CB13) - DOES NOT STAY CLOSED OR CONTINUITY TO AUDIO JUNCTION UNIT DOES NOT EXIST BETWEEN J4-C AND J1-5

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

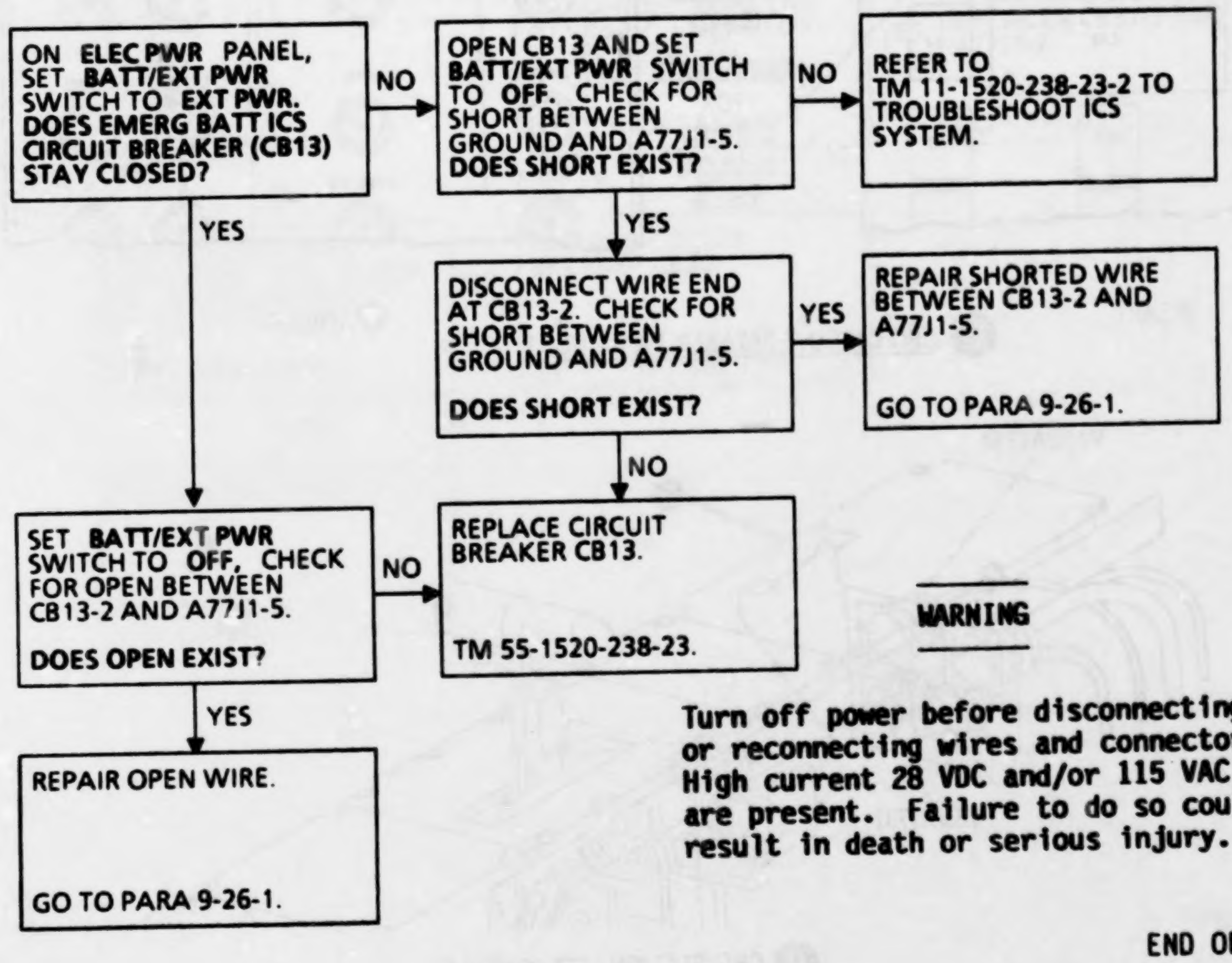
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - CPG circuit breaker panel no. 1 removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES EMERG BATT ICS CIRCUIT BREAKER (CB13) STAY CLOSED?
NO
OPEN CB13 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J1-5. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT ICS SYSTEM.
YES
DISCONNECT WIRE END AT CB13-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-5. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB13-2 AND A77J1-5. GO TO PARA 9-26-1.
NO
REPLACE CIRCUIT BREAKER CB13. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB13-2 AND A77J1-5. DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-26-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-26-5. CONTINUITY - DOES NOT EXIST BETWEEN A77J4-C AND CB29-1 OR 28 VDC IS NOT PRESENT AT P769-C

Tools: (para 9-26-4)

Personnel Required: (para 9-26-4)

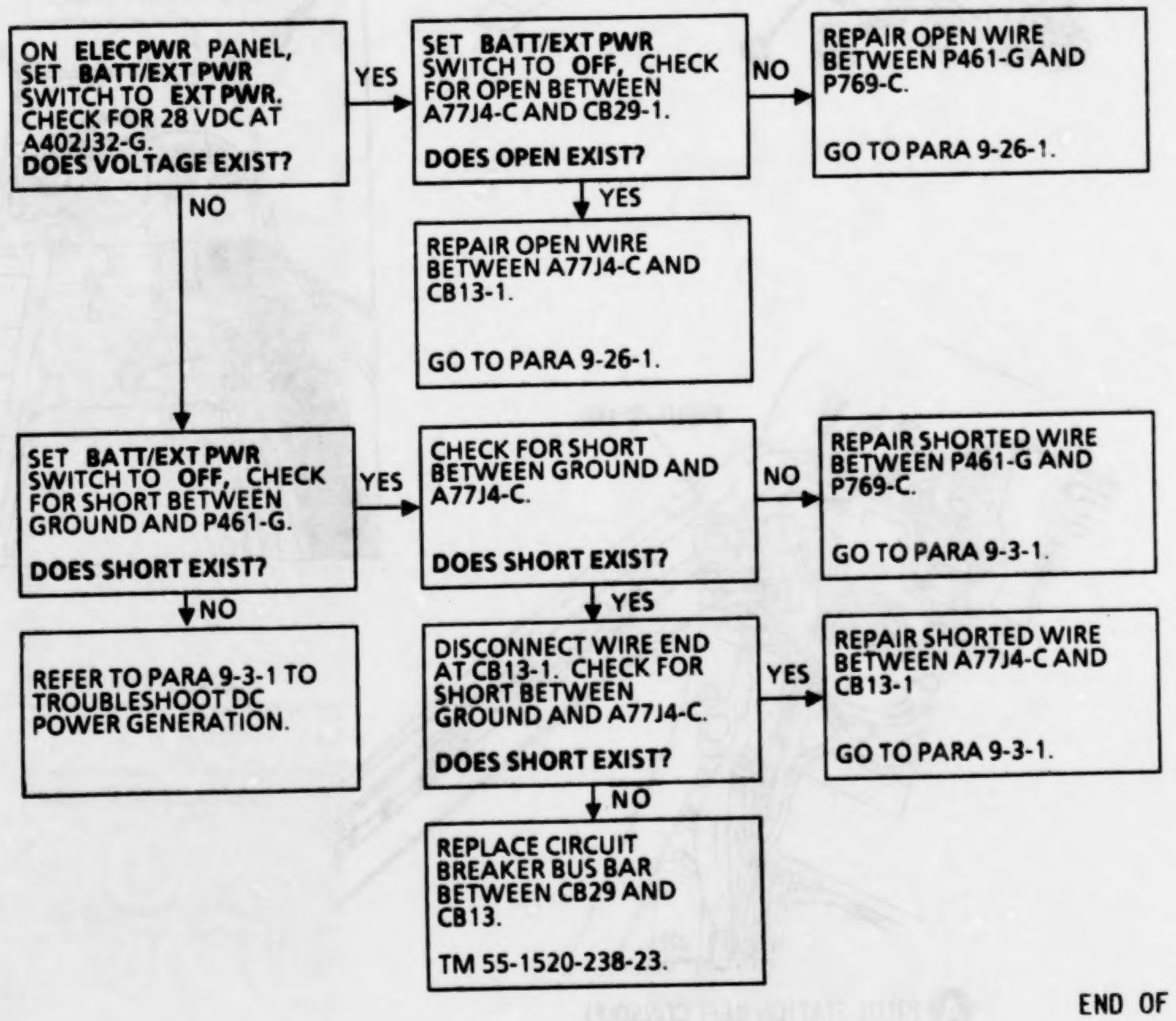
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-26-1	All DC emergency circuit breakers open

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. CHECK FOR 28 VDC AT A402J32-G. DOES VOLTAGE EXIST?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN A77J4-C AND CB29-1. DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN P461-G AND P769-C. GO TO PARA 9-26-1.
YES
REPAIR OPEN WIRE BETWEEN A77J4-C AND CB13-1. GO TO PARA 9-26-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P461-G. DOES SHORT EXIST?
YES
CHECK FOR SHORT BETWEEN GROUND AND A77J4-C. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN P461-G AND P769-C. GO TO PARA 9-3-1.
NO
REFER TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION.
YES
DISCONNECT WIRE END AT CB13-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-C. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN A77J4-C AND CB13-1 GO TO PARA 9-3-1.
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB29 AND CB13. TM 55-1520-238-23.

END OF TASK

9-26-6. EMERG BATT VHF AM/FM CIRCUIT BREAKER (CB32) - DOES NOT STAY CLOSED OR CONTINUITY TO RADIO CONTROL PANEL DOES NOT EXIST BETWEEN J4-C AND J1-7

Tools: (para 9-26-4)

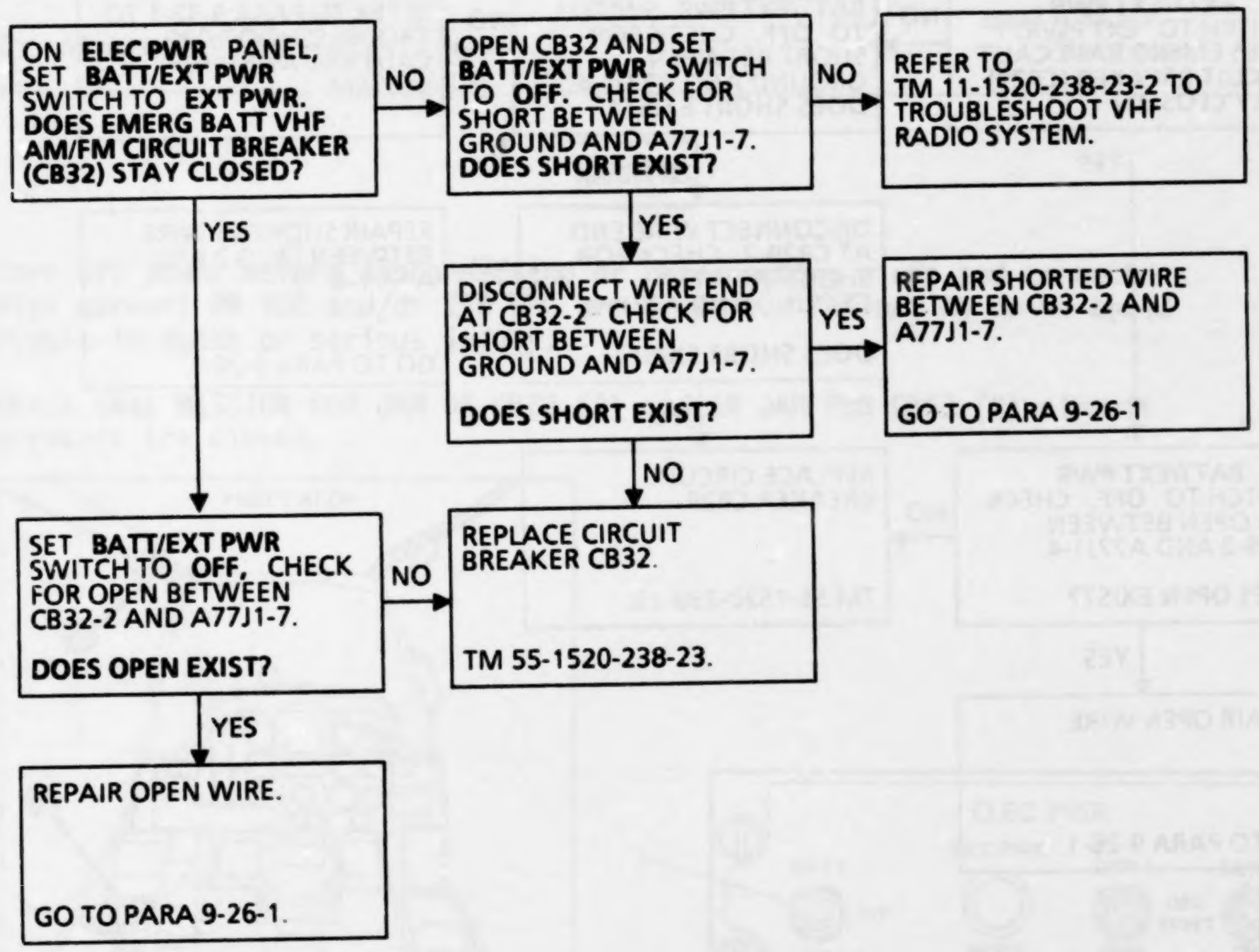
Personnel Required: (para 9-26-4)

References: (para 9-26-4)

Equipment Conditions: (para 9-26-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES EMERG BATT VHF AM/FM CIRCUIT BREAKER (CB32) STAY CLOSED?
NO
OPEN CB32 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J1-7. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT VHF RADIO SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB32-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-7. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB32-2 AND A77J1-7. GO TO PARA 9-26-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB32-2 AND A77J1-7. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB32. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-26-1.

END OF TASK

9-26-7. EMERG BATT ENG INST CIRCUIT BREAKER (CB31) - DOES NOT STAY CLOSED OR CONTINUITY TO SIGNAL DATA CONVERTER DOES NOT EXIST BETWEEN J4-C AND J1-8, -10

Tools: (para 9-26-4)

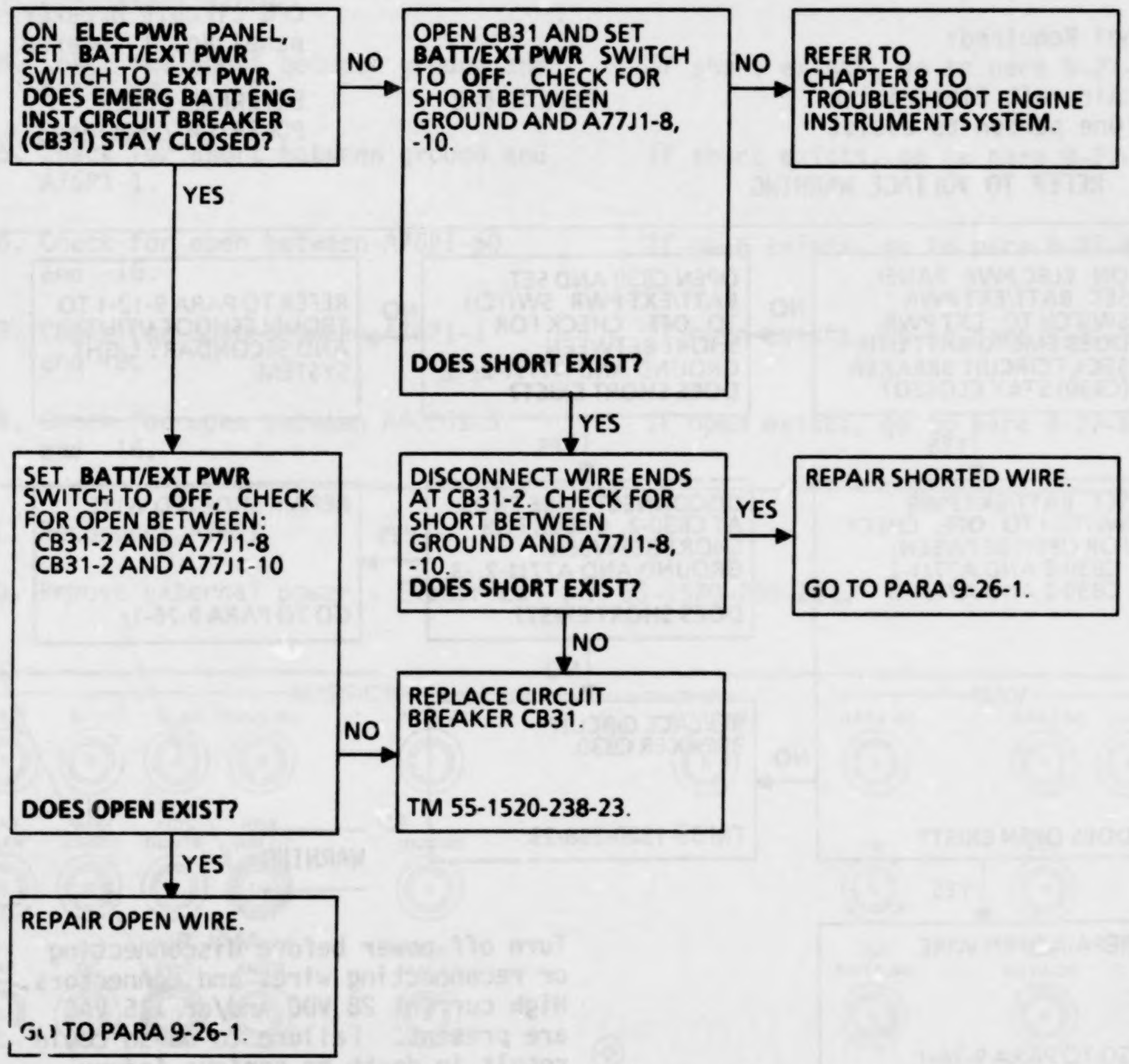
Personnel Required: (para 9-26-4)

References: (para 9-26-4)

Equipment Conditions: (para 9-26-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES EMERG BATT ENG INST CIRCUIT BREAKER (CB31) STAY CLOSED?
NO
OPEN CB31 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J1-8, -10. DOES SHORT EXIST?
NO
REFER TO CHAPTER 8 TO TROUBLESHOOT ENGINE INSTRUMENT SYSTEM.
YES
YES
DISCONNECT WIRE ENDS AT CB31-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-8, -10. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-26-1.
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB31-2 AND A77J1-8 CB31-2 AND A77J1-10 DOES OPEN EXIST?
NO
NO
REPLACE CIRCUIT BREAKER CB31. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-26-1.

END OF TASK

9-26-8. EMERG BATT UTIL SEC LT CIRCUIT BREAKER (CB30) - DOES NOT STAY CLOSED OR CONTINUITY TO CPG INTERIOR LIGHT PANEL DOES NOT EXIST BETWEEN J4-C AND J1-2, -3

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

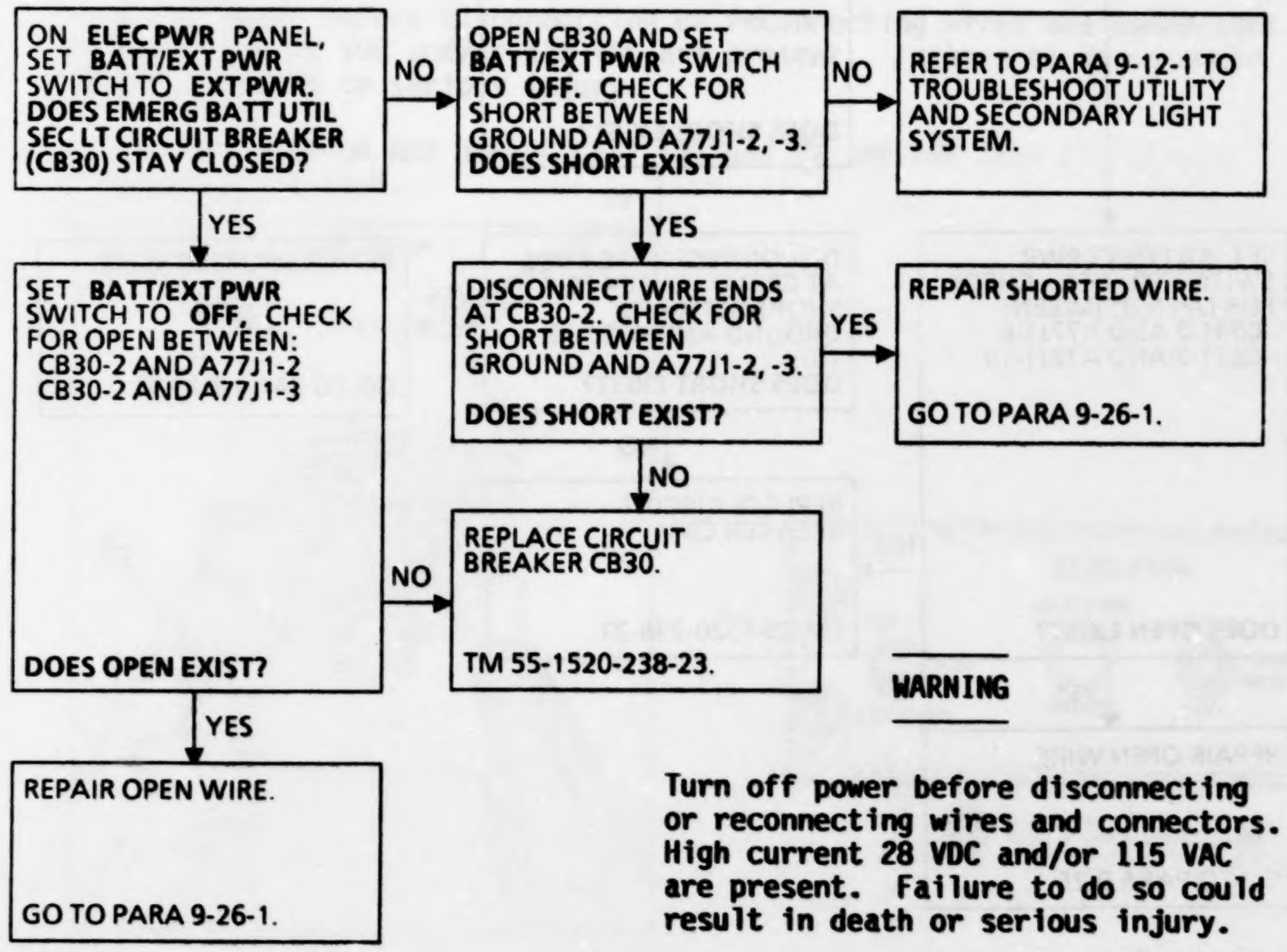
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Access provisions - CPG circuit breaker panel No. 1 lowered
Para 9-5-2	EXTERNAL POWER - POWER UP completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES EMERG BATT UTIL SEC LT CIRCUIT BREAKER (CB30) STAY CLOSED?
NO
OPEN CB30 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J1-2, -3. DOES SHORT EXIST?
NO
REFER TO PARA 9-12-1 TO TROUBLESHOOT UTILITY AND SECONDARY LIGHT SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB30-2 AND A77J1-2 CB30-2 AND A77J1-3
DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB30-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-2, -3.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-26-1.
NO
NO
REPLACE CIRCUIT BREAKER CB30.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-26-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-26-9. EMERG BATT CAUT CIRCUIT BREAKER (CB29) - DOES NOT STAY CLOSED OR CONTINUITY TO MASTER AND CAUTION/WARNING PANELS DOES NOT EXIST BETWEEN J4-C AND J1-4

Tools: (para 9-26-8)

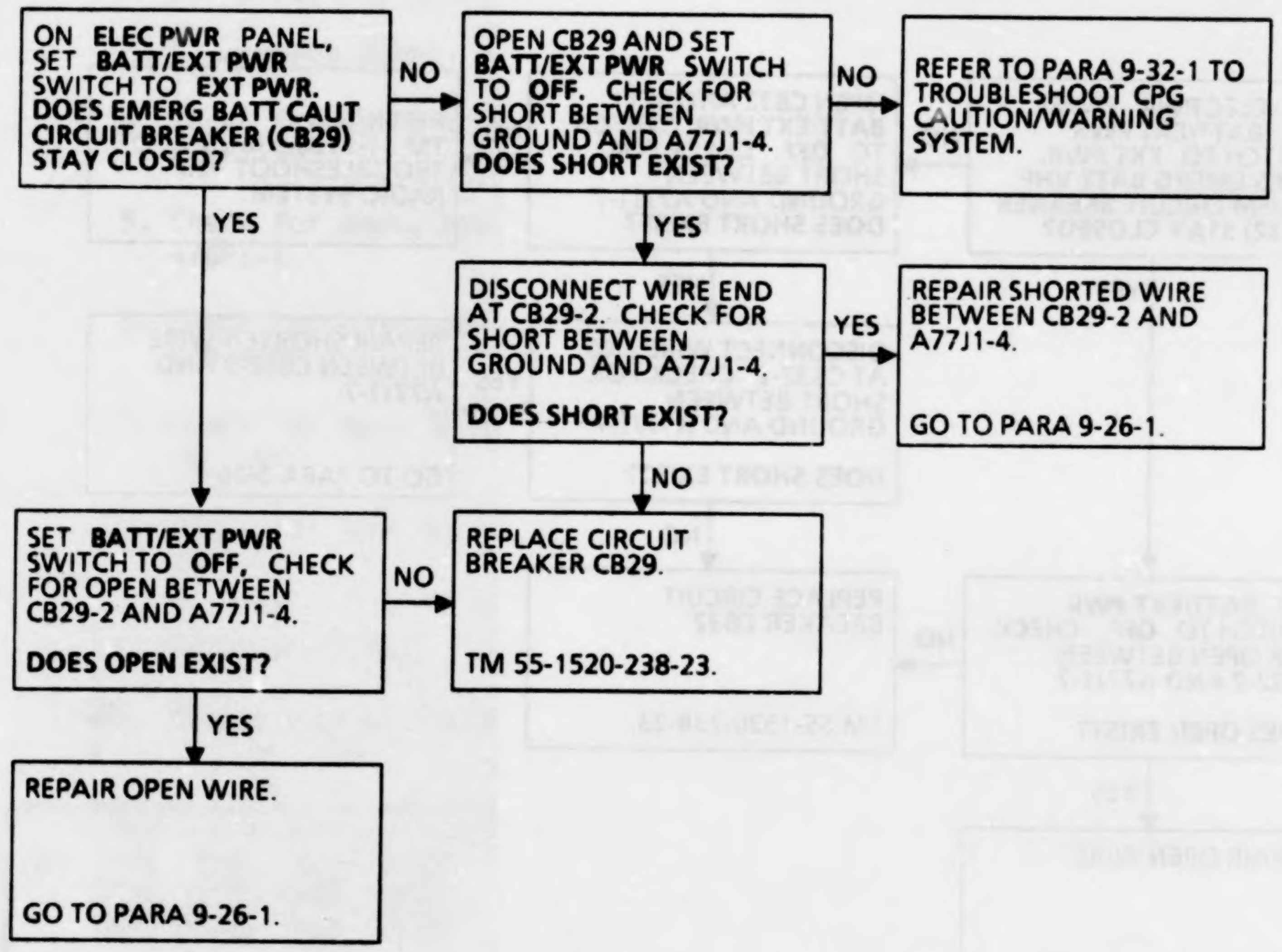
Personnel Required: (para 9-26-8)

References: (para 9-26-8)

Equipment Conditions: (para 9-26-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES EMERG BATT CAUT CIRCUIT BREAKER (CB29) STAY CLOSED?
NO
OPEN CB29 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J1-4. DOES SHORT EXIST?
NO
REFER TO PARA 9-32-1 TO TROUBLESHOOT CPG CAUTION/WARNING SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB29-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-4.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB29-2 AND A77J1-4.
GO TO PARA 9-26-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB29-2 AND A77J1-4.
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB29.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-26-1.

END OF TASK

9-27-1. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

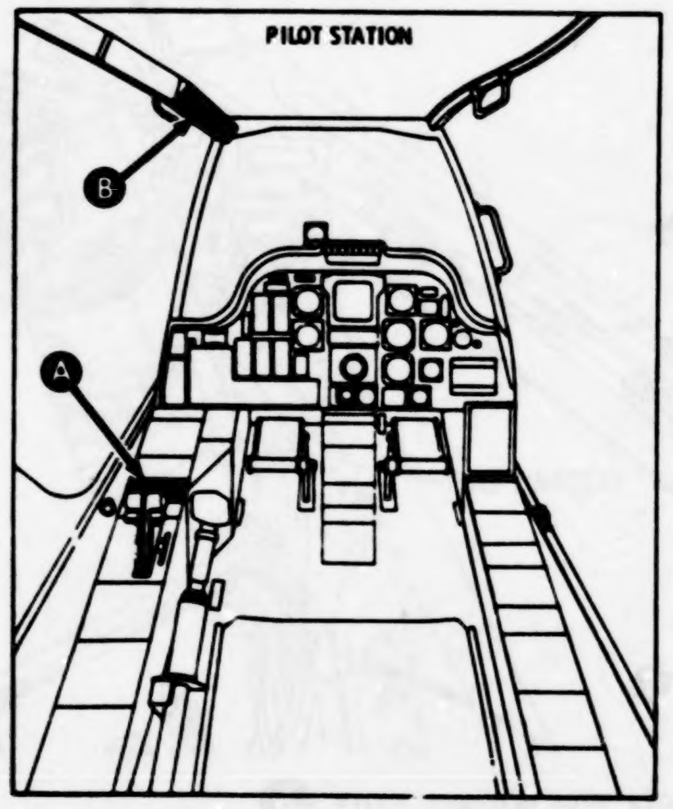
Equipment Conditions:

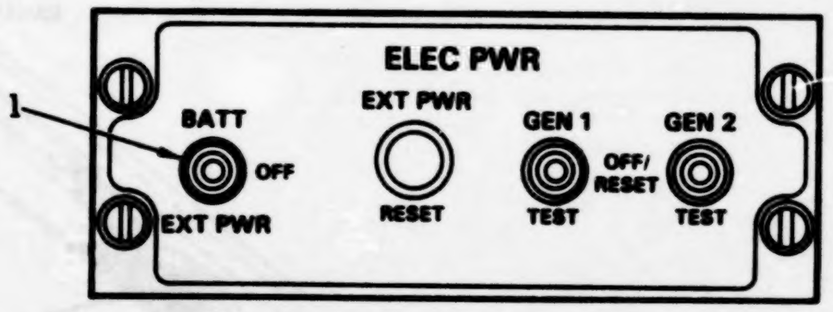
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

A. Check that MISSION RDR JAM DC CB72 (3) and IR JAM PWR CB63 (2) circuit breakers are closed.


PILOT STATION
B
A


ELEC PWR
1
BATT
EXT PWR
OFF
EXT PWR
RESET
GEN 1
TEST
OFF/
RESET
GEN 2
TEST

Ⓐ PILOT ELEC PWR PANEL

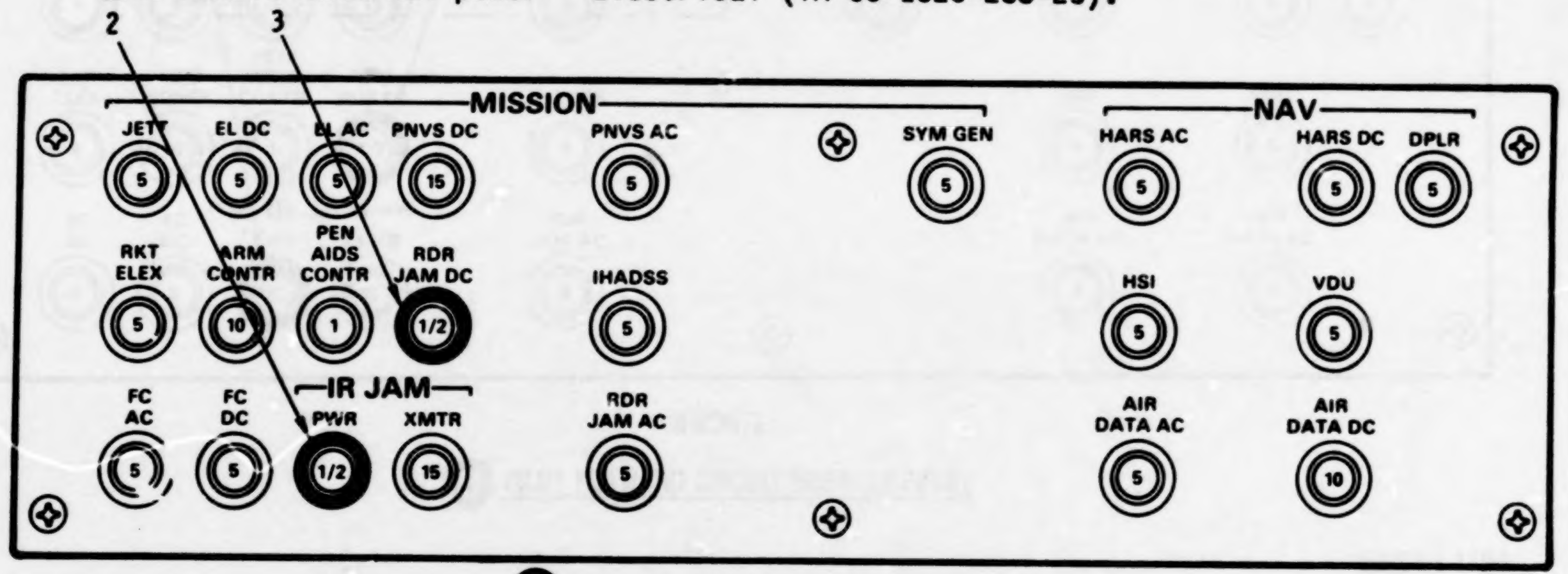
MM04/1-1017B

B. Complete operational check as follows:

TASK	RESULT
1. Check that CB72 (3) and CB63 (2) remain closed.	If CB63 or CB72 do not stay closed, refer to TM 11-1520-238-23-2 to troubleshoot radar and IR jammer system.
2. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.	
3. Disconnect A76P1.	
4. Check for short between ground and A76P1-50.	If short exists, go to para 9-27-4.
5. Check for short between ground and A76P1-1.	If short exists, go to para 9-27-5.
6. Check for open between A76P1-50 and -16.	If open exists, go to para 9-27-4.
7. Check for open between A76P1-1 and -8.	If open exists, go to para 9-27-5.
8. Check for open between A402J1-8 and -16.	If open exists, go to para 9-27-6.

C. Reconnect A76P1.

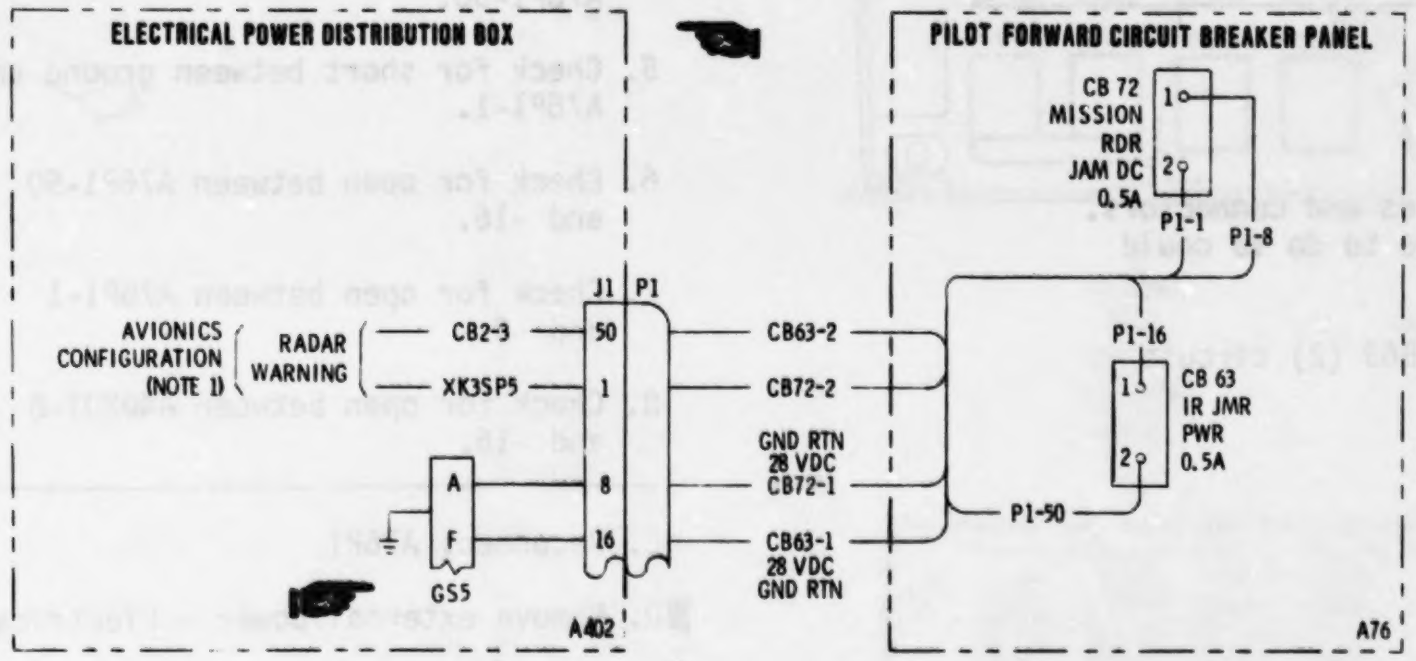
D. Remove external power - Electrical (TM 55-1520-238-23).


2
3
MISSION
JETT
EL DC
EL AC
PNVS DC
PNVS AC
SYM GEN
NAV
HARS AC
HARS DC
DPLR
5
5
5
15
5
5
5
5
5
RKT ELEX
ARM CONTR
PEN AIDS CONTR
RDR JAM DC
IHADSS
HSI
VDU
5
10
1
1/2
5
5
5
IR JAM
FC AC
FC DC
PWR
XMTR
RDR JAM AC
AIR DATA AC
AIR DATA DC
5
5
1/2
15
5
5
10

Ⓑ PILOT FORWARD CIRCUIT BREAKER PANEL

END OF TASK

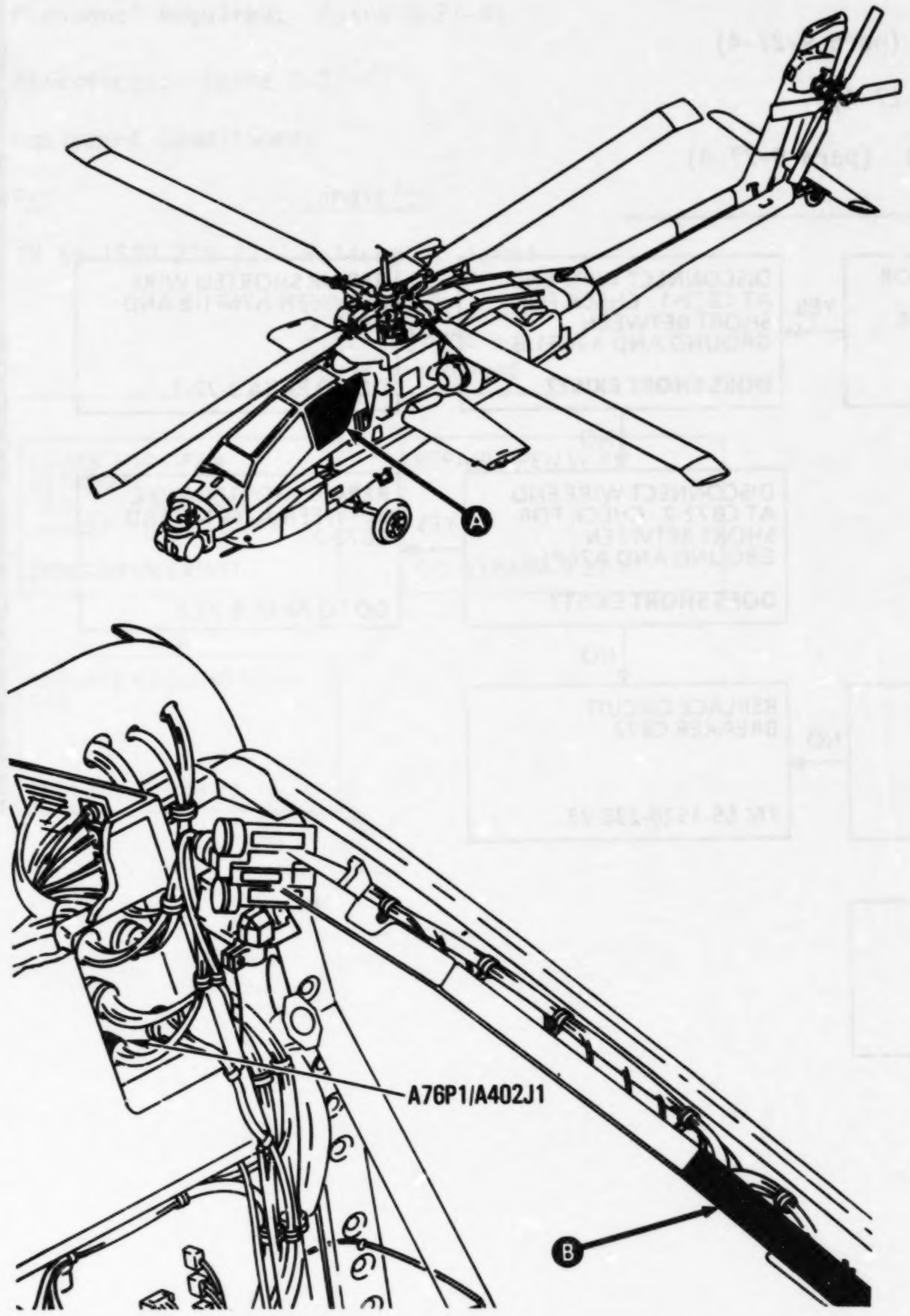
9-27-2. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - PILOT STATION) - INTERCONNECTION DIAGRAM


ELECTRICAL POWER DISTRIBUTION BOX
AVIONICS CONFIGURATION (NOTE 1)
RADAR WARNING
CB2-3
XK3SP5
J1
P1
50
1
8
16
A
F
GS5
A402
CB63-2
CB72-2
GND RTN 28 VDC CB72-1
CB63-1 28 VDC GND RTN
PILOT FORWARD CIRCUIT BREAKER PANEL
CB 72 MISSION RDR JAM DC 0.5A
1
2
P1-1
P1-8
P1-16
CB 63 IR JMR PWR 0.5A
P1-50
A76

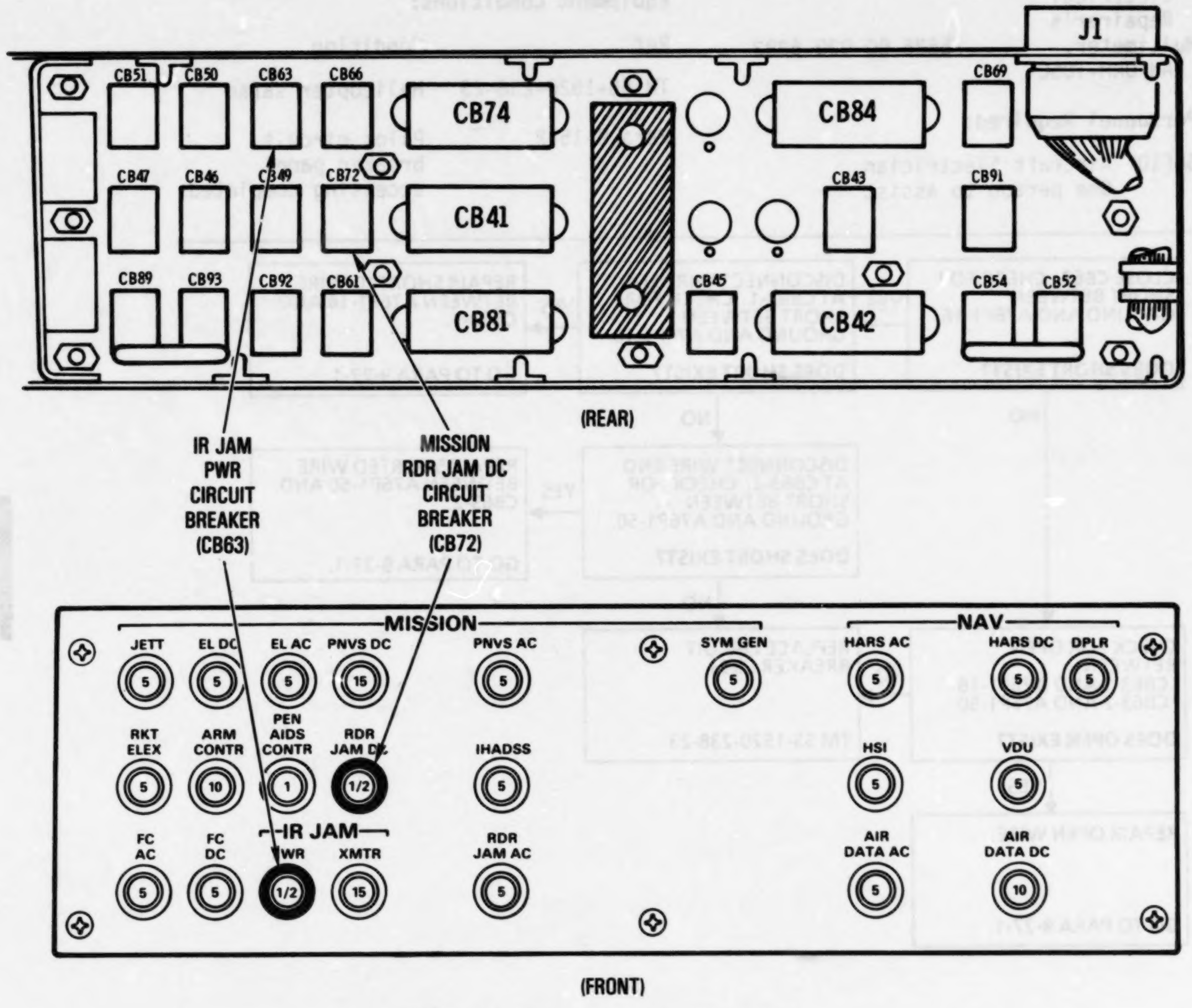
NOTE:
1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-770B

9-27-3. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
A76P1/A402J1
B

Ⓐ PILOT STATION (LEFT SIDE)


J1
CB51
CB50
CB63
CB66
CB74
CB84
CB69
CB47
CB46
CB49
CB72
CB41
CB43
CB91
CB89
CB93
CB92
CB61
CB81
CB45
CB42
CB54
CB52
(REAR)
IR JAM PWR CIRCUIT BREAKER (CB63)
MISSION RDR JAM DC CIRCUIT BREAKER (CB72)
MISSION
NAV
JETT 5
EL DC 5
EL AC 5
PNVS DC 15
PNVS AC 5
SYM GEN 5
HARS AC 5
HARS DC 5
DPLR 5
RKT ELEX 5
ARM CONTR 10
PEN AIDS CONTR 1
RDR JAM DC 1/2
IHADSS 5
HSI 5
VDU 5
IR JAM
FC AC 5
FC DC 5
PWR 1/2
XMTR 15
RDR JAM AC 5
AIR DATA AC 5
AIR DATA DC 10
(FRONT)

Ⓑ PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-1194

9-27-4. OPEN EXISTS BETWEEN A76P1-50 AND -16 OR A SHORT EXISTS BETWEEN GROUND AND A76P1-16

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

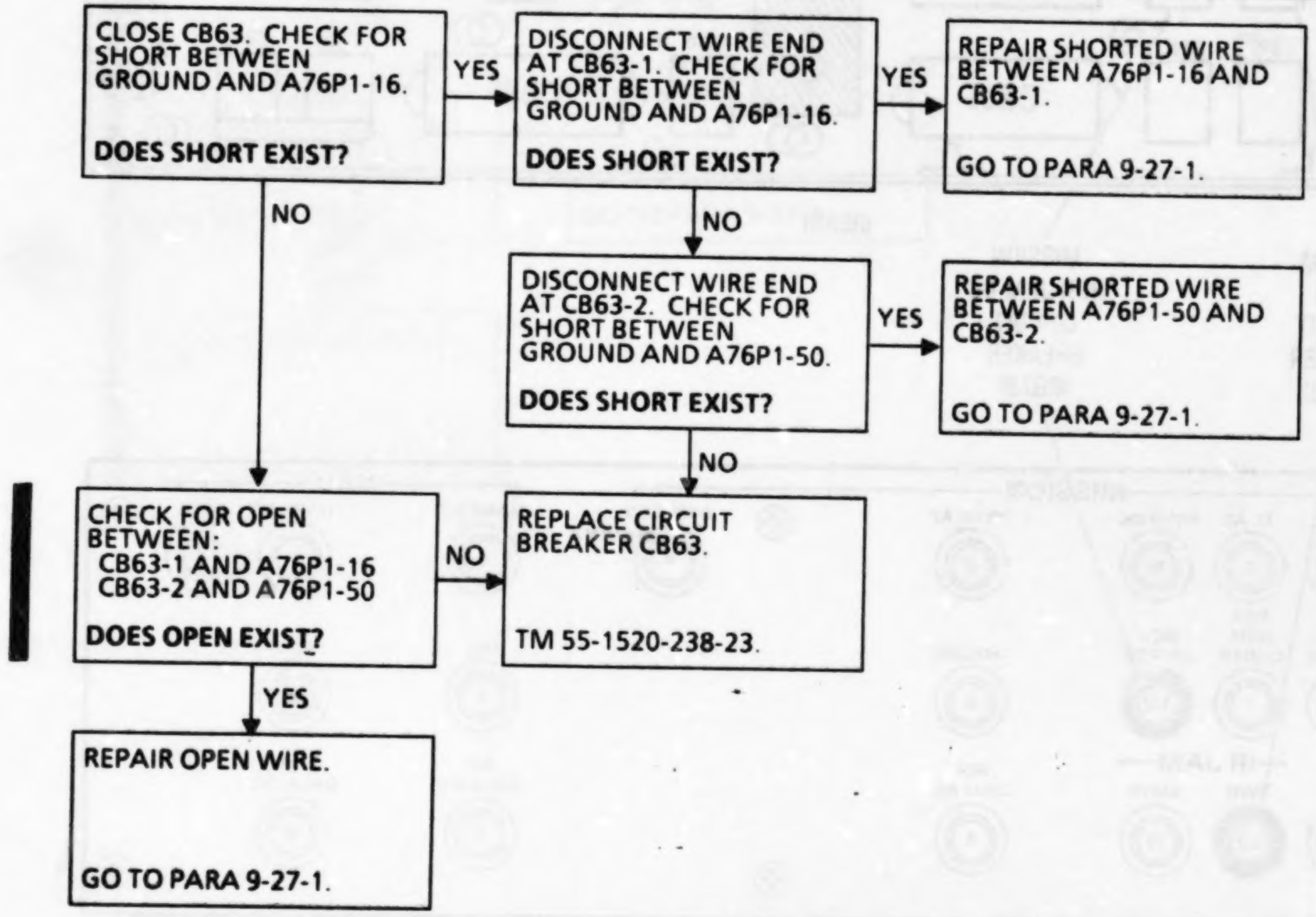
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed


CLOSE CB63. CHECK FOR SHORT BETWEEN GROUND AND A76P1-16.
DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB63-1. CHECK FOR SHORT BETWEEN GROUND AND A76P1-16.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN A76P1-16 AND CB63-1.
GO TO PARA 9-27-1.
NO
DISCONNECT WIRE END AT CB63-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-50.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN A76P1-50 AND CB63-2.
GO TO PARA 9-27-1.
NO
REPLACE CIRCUIT BREAKER CB63.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN:
CB63-1 AND A76P1-16
CB63-2 AND A76P1-50
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-27-1.

END OF TASK

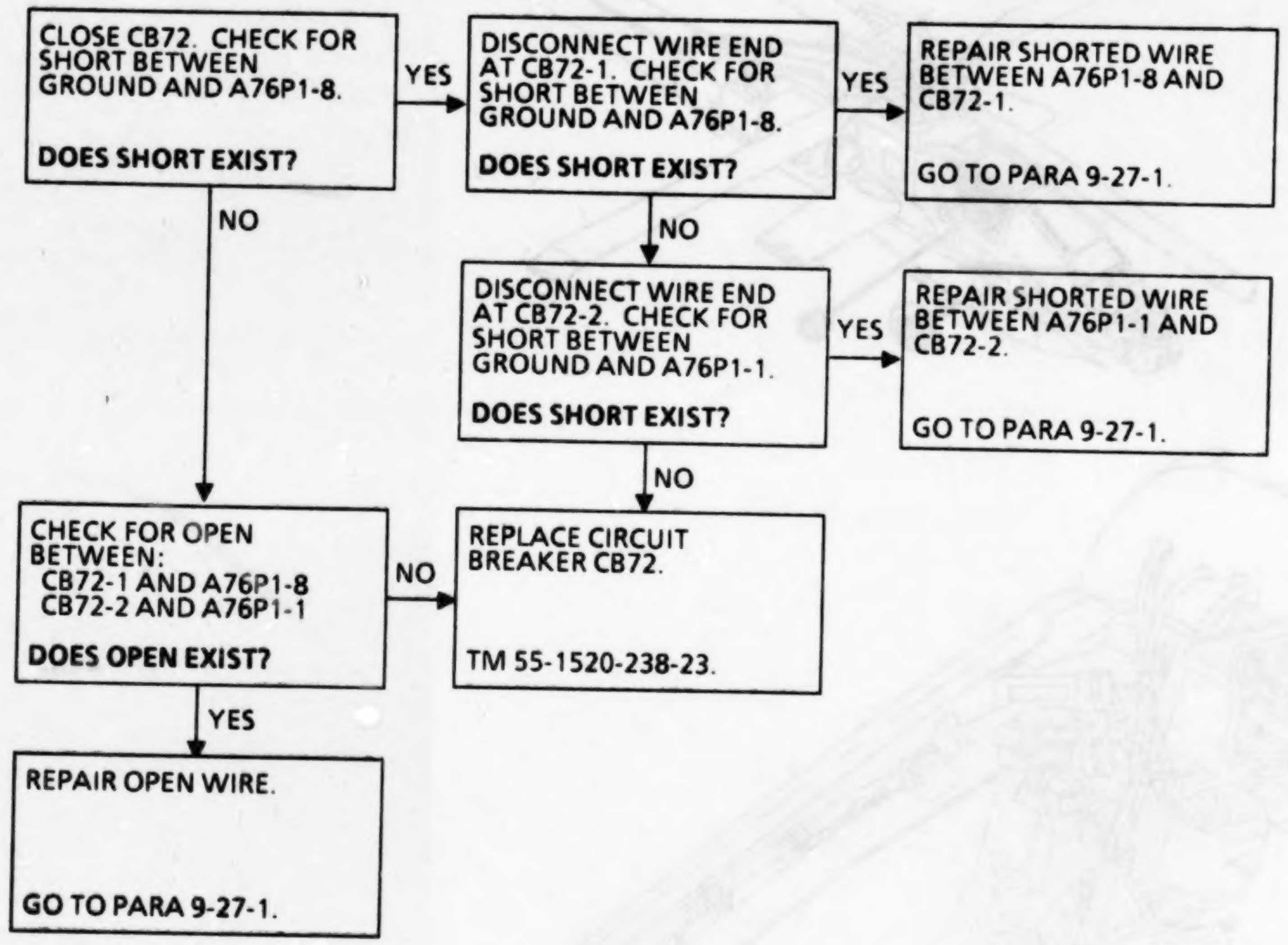
9-27-5. OPEN EXISTS BETWEEN A76P1-1 AND -8 OR A SHORT EXISTS BETWEEN GROUND AND A76P1-1

Tools: (para 9-27-4)

Personnel Required: (para 9-27-4)

References: (para 9-27-4)

Equipment Conditions: (para 9-27-4)


CLOSE CB72. CHECK FOR SHORT BETWEEN GROUND AND A76P1-8.
DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB72-1. CHECK FOR SHORT BETWEEN GROUND AND A76P1-8.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN A76P1-8 AND CB72-1.
GO TO PARA 9-27-1.
NO
DISCONNECT WIRE END AT CB72-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-1.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN A76P1-1 AND CB72-2.
GO TO PARA 9-27-1.
NO
REPLACE CIRCUIT BREAKER CB72.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN:
CB72-1 AND A76P1-8
CB72-2 AND A76P1-1
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-27-1.

END OF TASK

9-27-6. OPEN EXISTS BETWEEN A402J1-8 AND -16

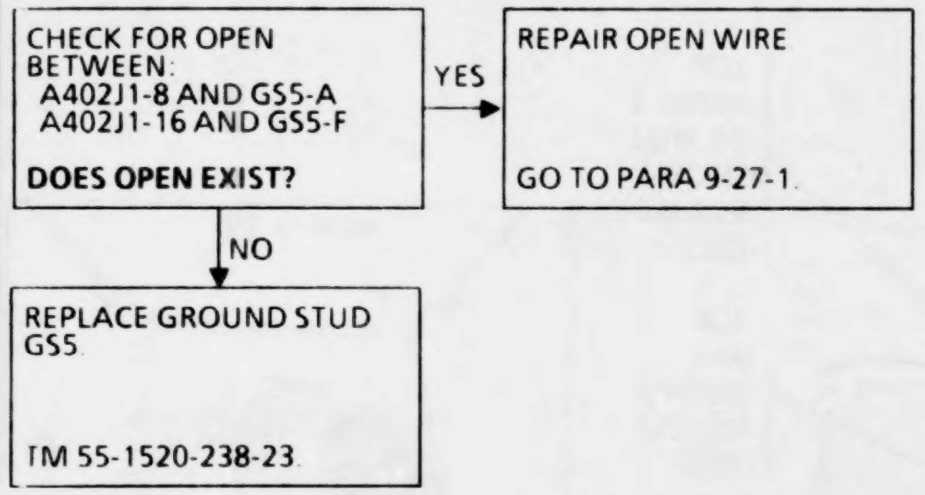
Tools: (para 9-27-4)

Personnel Required: (para 9-27-4)

References: (para 9-27-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power distribution box cover - removed


CHECK FOR OPEN BETWEEN:
A402J1-8 AND GS5-A
A402J1-16 AND GS5-F
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-27-1
NO
REPLACE GROUND STUD GS5
TM 55-1520-238-23

END OF TASK

9-28-1. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - CPG STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

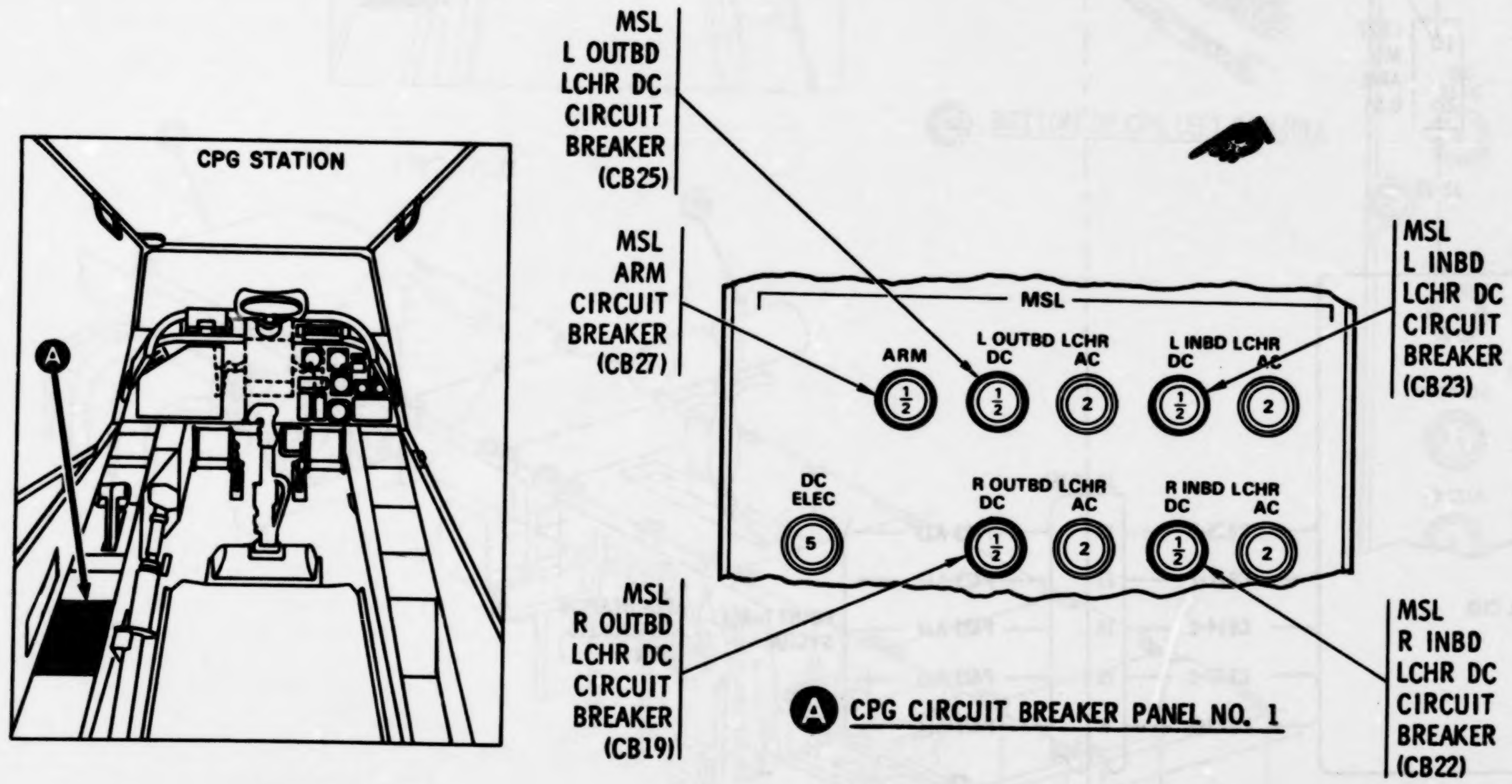
68F10	Aircraft Electrician One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CPG STATION
A
MSL L OUTBD LCHR DC CIRCUIT BREAKER (CB25)
MSL ARM CIRCUIT BREAKER (CB27)
MSL R OUTBD LCHR DC CIRCUIT BREAKER (CB19)
MSL L INBD LCHR DC CIRCUIT BREAKER (CB23)
MSL R INBD LCHR DC CIRCUIT BREAKER (CB22)
MSL
ARM
L OUTBD LCHR
DC
AC
L INBD LCHR
DC
AC
DC ELEC
R OUTBD LCHR
DC
AC
R INBD LCHR
DC
AC
½
2
5

Ⓐ CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1018B

A. Open all CPG DC ground circuit breakers.

B. Complete operational check as follows:

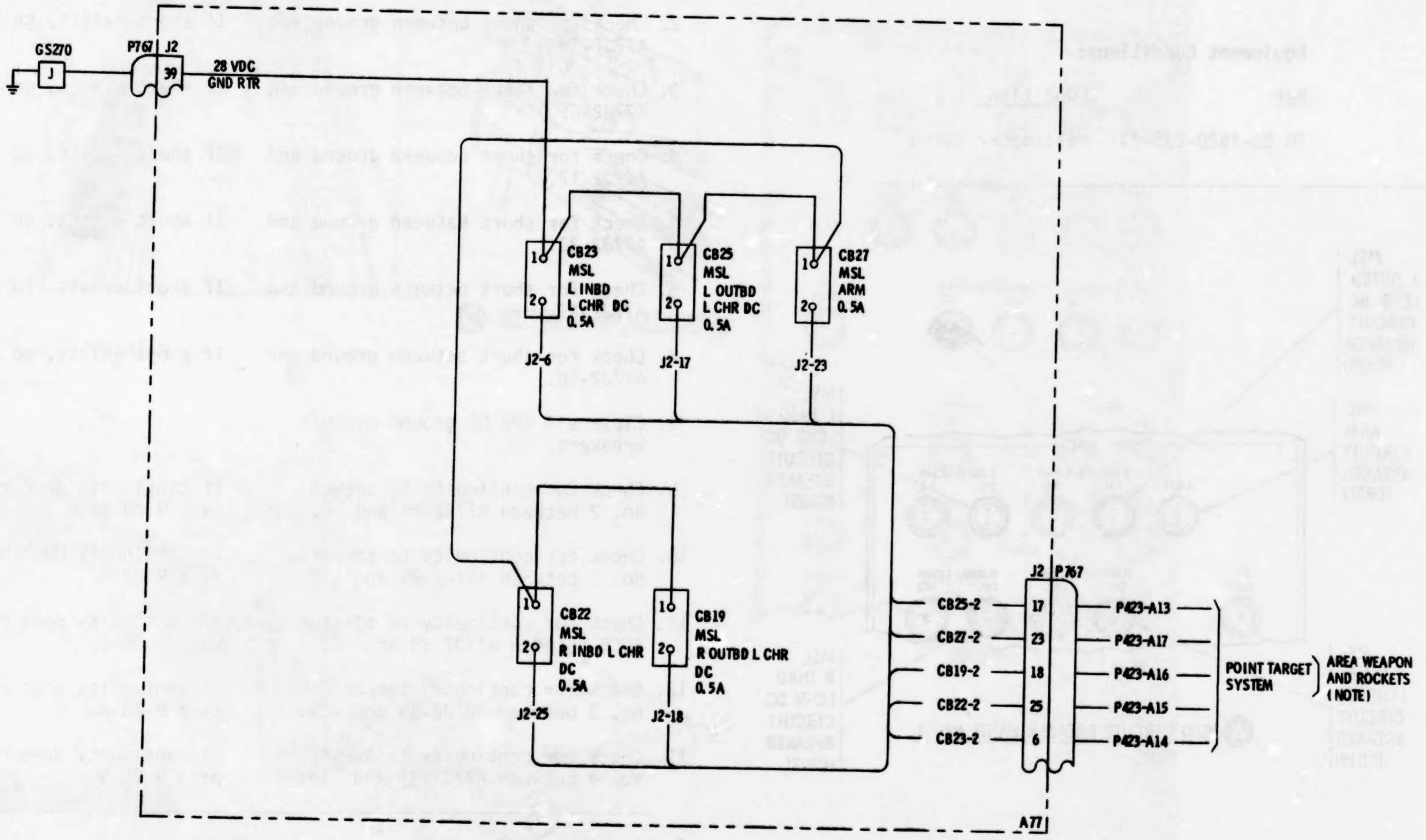
TASK	RESULT
1. Disconnect P767.	
2. Check for short between ground and A77J2-39.	If short exists, go to para 9-28-4.
3. Check for short between ground and A77J2-6.	If short exists, go to para 9-28-5.
4. Check for short between ground and A77J2-17.	If short exists, go to para 9-28-6.
5. Check for short between ground and A77J2-23.	If short exists, go to para 9-28-7.
6. Check for short between ground and A77J2-25.	If short exists, to to para 9-28-8.
7. Check for short between ground and A77J2-18.	If short exists, go to para 9-28-9.
8. Close all CPG DC ground circuit breakers.	
9. Check for continuity to seeker No. 2 between A77J2-39 and -6.	If continuity does not exist, go to para 9-28-5.
10. Check for continuity to seeker No. 1 between A77J2-39 and -17.	If continuity does not exist, go to para 9-28-6.
11. Check for continuity to ejector RCCB between A77J2-39 and -23.	If continuity does not exist, go to para 9-28-7.
12. Check for continuity seeker No. 3 between A77J2-39 and -25.	If continuity does not exist, go to para 9-28-8.
13. Check for continuity to seeker No. 4 between A77J2-39 and -18.	If continuity does not exist, go to para 9-28-9.

C. Reconnect P767.

D. Reinstall CPG circuit breaker panel No. 1 (TM 55-1520-238-23).

END OF TASK

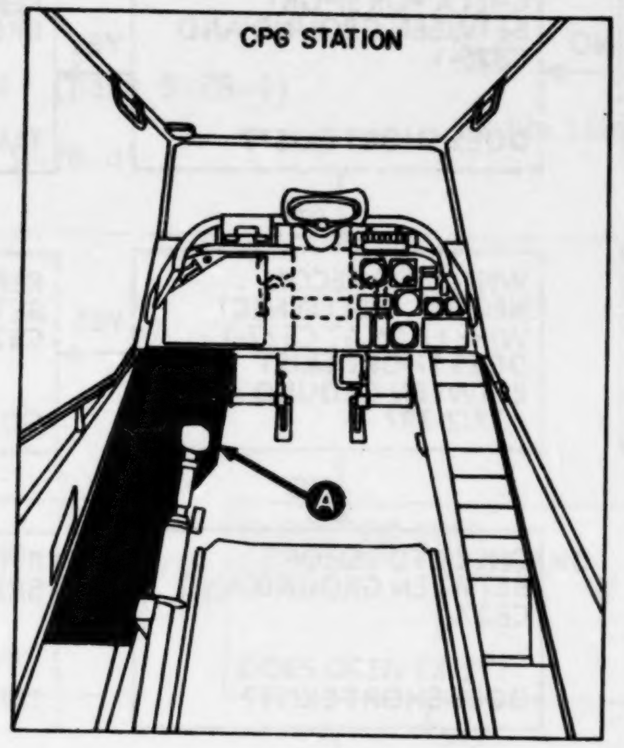
9-28-2. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - CPG STATION) - INTERCONNECTION DIAGRAM

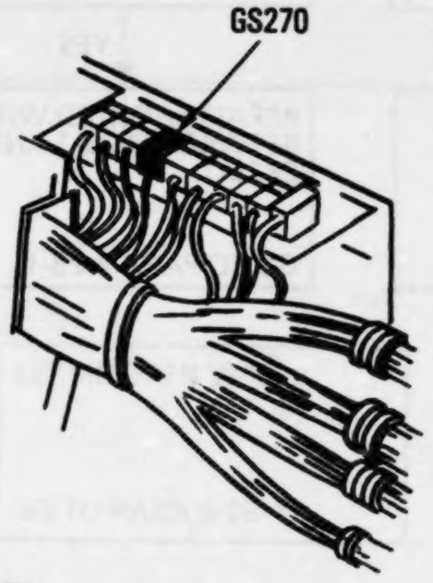

GS270
J
P767
J2
39
28 VDC
GND RTR
1
2
CB23
MSL
L INBD
L CHR DC
0.5A
J2-6
CB25
MSL
L OUTBD
L CHR DC
0.5A
J2-17
CB27
MSL
ARM
0.5A
J2-23
CB22
MSL
R INBD L CHR
DC
0.5A
J2-25
CB19
MSL
R OUTBD L CHR
DC
0.5A
J2-18
J2
P767
CB25-2
17
P423-A13
CB27-2
23
P423-A17
CB19-2
18
P423-A16
CB22-2
25
P423-A15
CB23-2
6
P423-A14
POINT TARGET SYSTEM
AREA WEAPON AND ROCKETS (NOTE)
A77

NOTE: SEE CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL LIST.

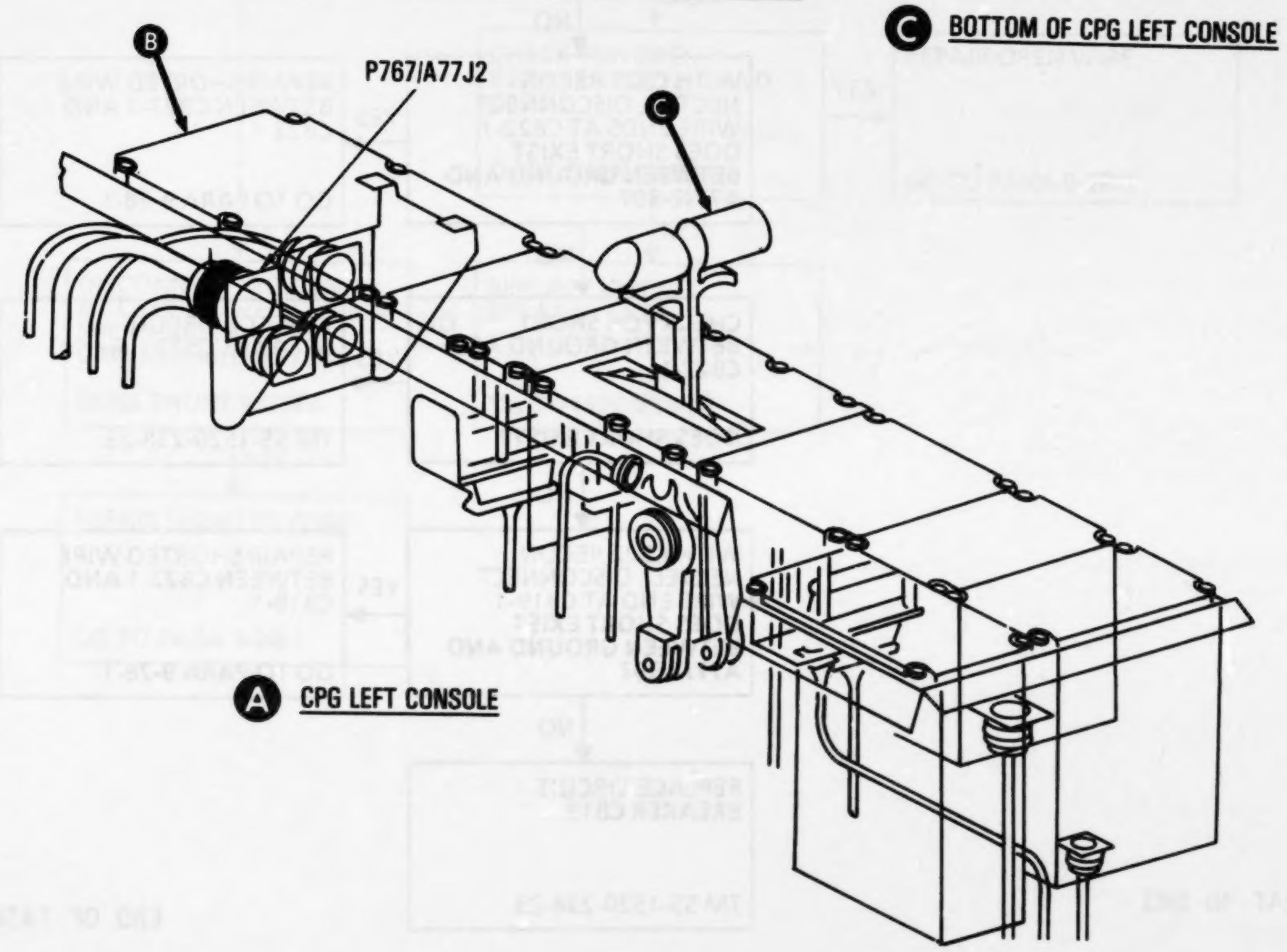
MM04/1-771A

9-28-3. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - CPG STATION) ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

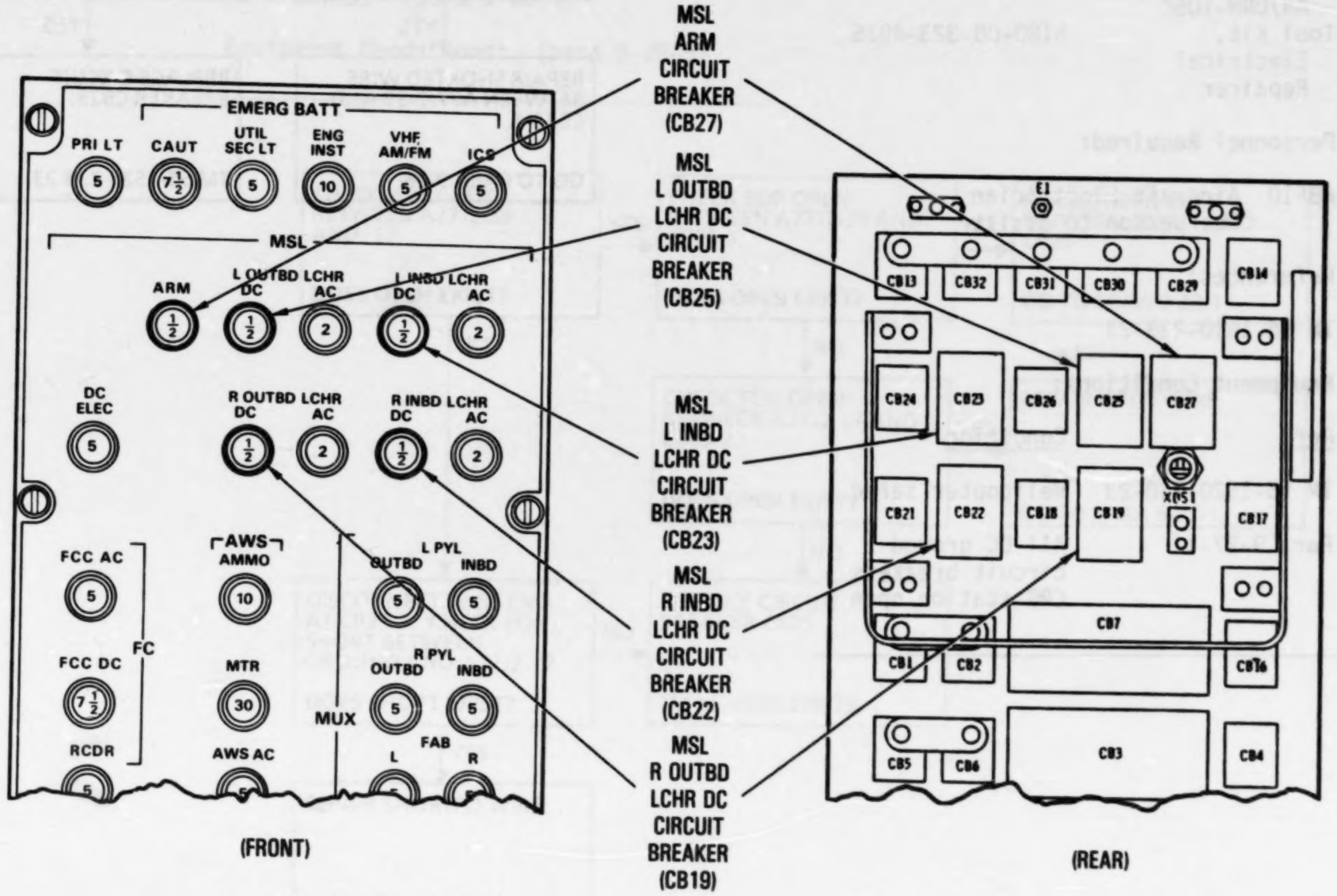

CPG STATION
A



C BOTTOM OF CPG LEFT CONSOLE


B
P767/A77J2
C

A CPG LEFT CONSOLE


EMERG BATT
PRI LT
5
CAUT
7½
UTIL SEC LT
5
ENG INST
10
VHF AM/FM
5
ICS
5
MSL
ARM
½
L OUTBD DC
½
LCHR AC
2
L INBD DC
½
LCHR AC
2
DC ELEC
5
R OUTBD DC
½
LCHR AC
2
R INBD DC
½
LCHR AC
2
FCC AC
5
FCC DC
7½
RCDR
5
FC
AWS
AMMO
10
MTR
30
AWS AC
MUX
L PYL
OUTBD
5
INBD
5
R PYL
OUTBD
5
INBD
5
FAB
L
R
(FRONT)
MSL ARM CIRCUIT BREAKER (CB27)
MSL L OUTBD LCHR DC CIRCUIT BREAKER (CB25)
MSL L INBD LCHR DC CIRCUIT BREAKER (CB23)
MSL R INBD LCHR DC CIRCUIT BREAKER (CB22)
MSL R OUTBD LCHR DC CIRCUIT BREAKER (CB19)
E1
CB13
CB32
CB31
CB30
CB29
CB14
CB24
CB23
CB26
CB25
CB27
CB21
CB22
CB18
CB19
XDS1
CB17
CB7
CB1
CB2
CB16
CB5
CB6
CB3
CB4
(REAR)

B CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1195B

9-28-4. SHORT EXISTS - BETWEEN GROUND AND A77J2-39

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

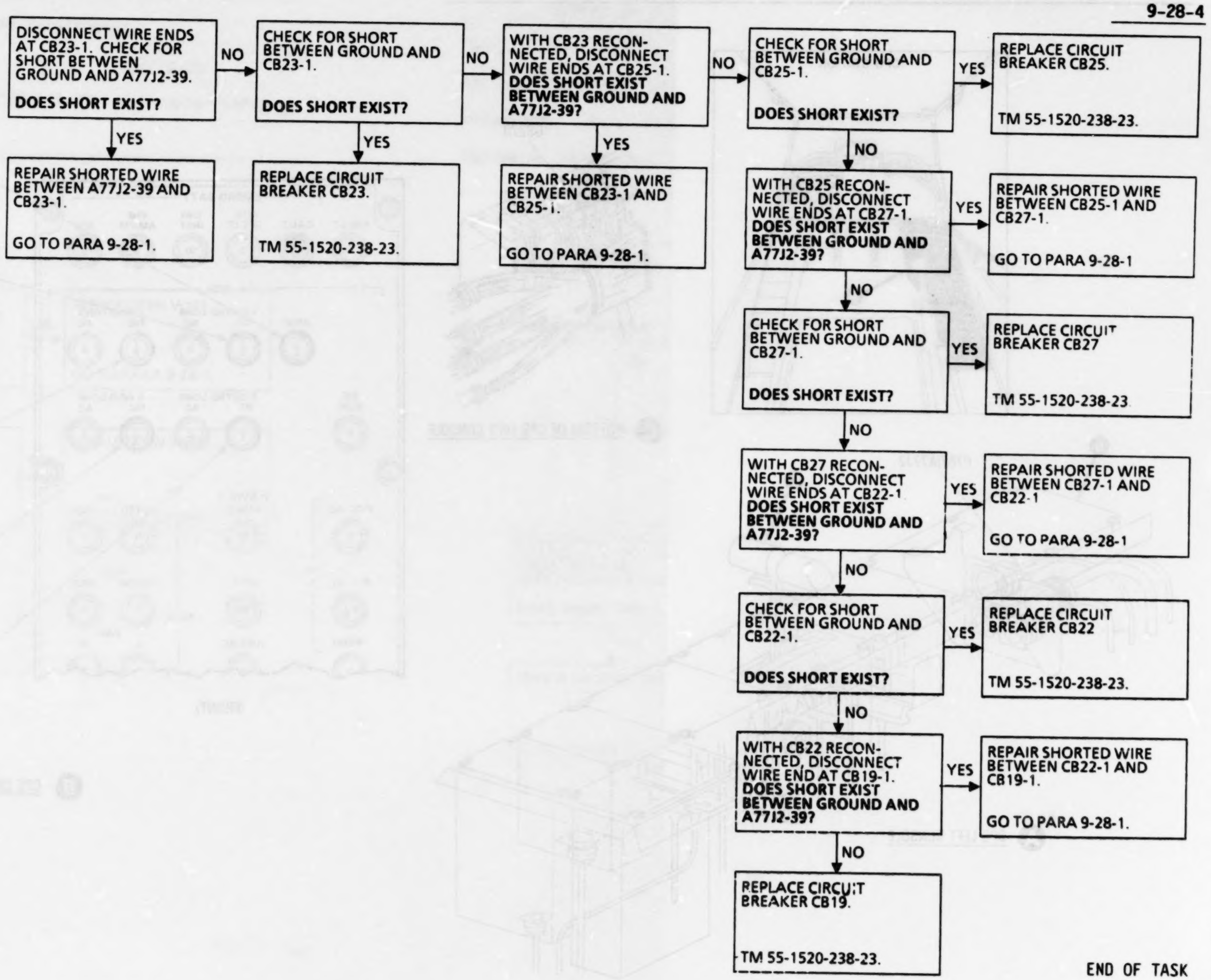
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-27-1	All DC ground circuit breakers - CPG station open



DISCONNECT WIRE ENDS AT CB23-1. CHECK FOR SHORT BETWEEN GROUND AND A77J2-39. DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN A77J2-39 AND CB23-1. GO TO PARA 9-28-1.

NO: CHECK FOR SHORT BETWEEN GROUND AND CB23-1. DOES SHORT EXIST?

YES: REPLACE CIRCUIT BREAKER CB23. TM 55-1520-238-23.

NO: WITH CB23 RECONNECTED, DISCONNECT WIRE ENDS AT CB25-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-39?

YES: REPAIR SHORTED WIRE BETWEEN CB23-1 AND CB25-1. GO TO PARA 9-28-1.

NO: CHECK FOR SHORT BETWEEN GROUND AND CB25-1. DOES SHORT EXIST?

YES: REPLACE CIRCUIT BREAKER CB25. TM 55-1520-238-23.

NO: WITH CB25 RECONNECTED, DISCONNECT WIRE ENDS AT CB27-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-39?

YES: REPAIR SHORTED WIRE BETWEEN CB25-1 AND CB27-1. GO TO PARA 9-28-1

NO: CHECK FOR SHORT BETWEEN GROUND AND CB27-1. DOES SHORT EXIST?

YES: REPLACE CIRCUIT BREAKER CB27 TM 55-1520-238-23

NO: WITH CB27 RECONNECTED, DISCONNECT WIRE ENDS AT CB22-1 DOES SHORT EXIST BETWEEN GROUND AND A77J2-39?

YES: REPAIR SHORTED WIRE BETWEEN CB27-1 AND CB22-1 GO TO PARA 9-28-1

NO: CHECK FOR SHORT BETWEEN GROUND AND CB22-1. DOES SHORT EXIST?

YES: REPLACE CIRCUIT BREAKER CB22 TM 55-1520-238-23.

NO: WITH CB22 RECONNECTED, DISCONNECT WIRE END AT CB19-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-39?

YES: REPAIR SHORTED WIRE BETWEEN CB22-1 AND CB19-1. GO TO PARA 9-28-1.

NO: REPLACE CIRCUIT BREAKER CB19. TM 55-1520-238-23.

END OF TASK

9-28-5. CONTINUITY BETWEEN A77J2-39 AND -6 - DOES NOT EXIST OR SHORT TO LAUNCHER SEEKER NO. 2 EXISTS BETWEEN GROUND AND A77J2-6

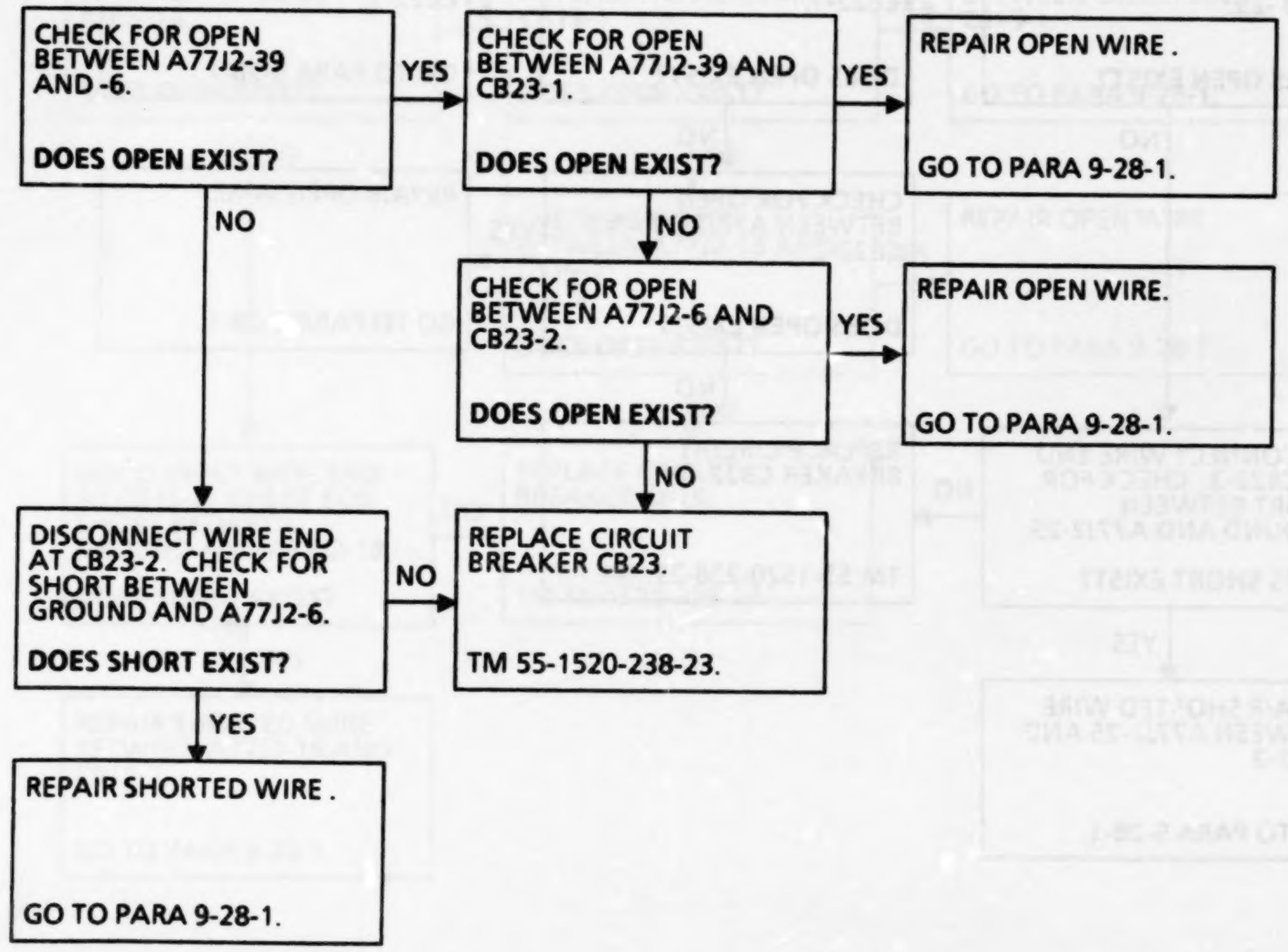
Tools: (para 9-28-4)

Personnel Required: (para 9-28-4)

References: (para 9-28-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CHECK FOR OPEN BETWEEN A77J2-39 AND -6.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB23-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
CHECK FOR OPEN BETWEEN A77J2-6 AND CB23-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
REPLACE CIRCUIT BREAKER CB23.
TM 55-1520-238-23.
NO
DISCONNECT WIRE END AT CB23-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-6.
DOES SHORT EXIST?
NO
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-28-1.

END OF TASK

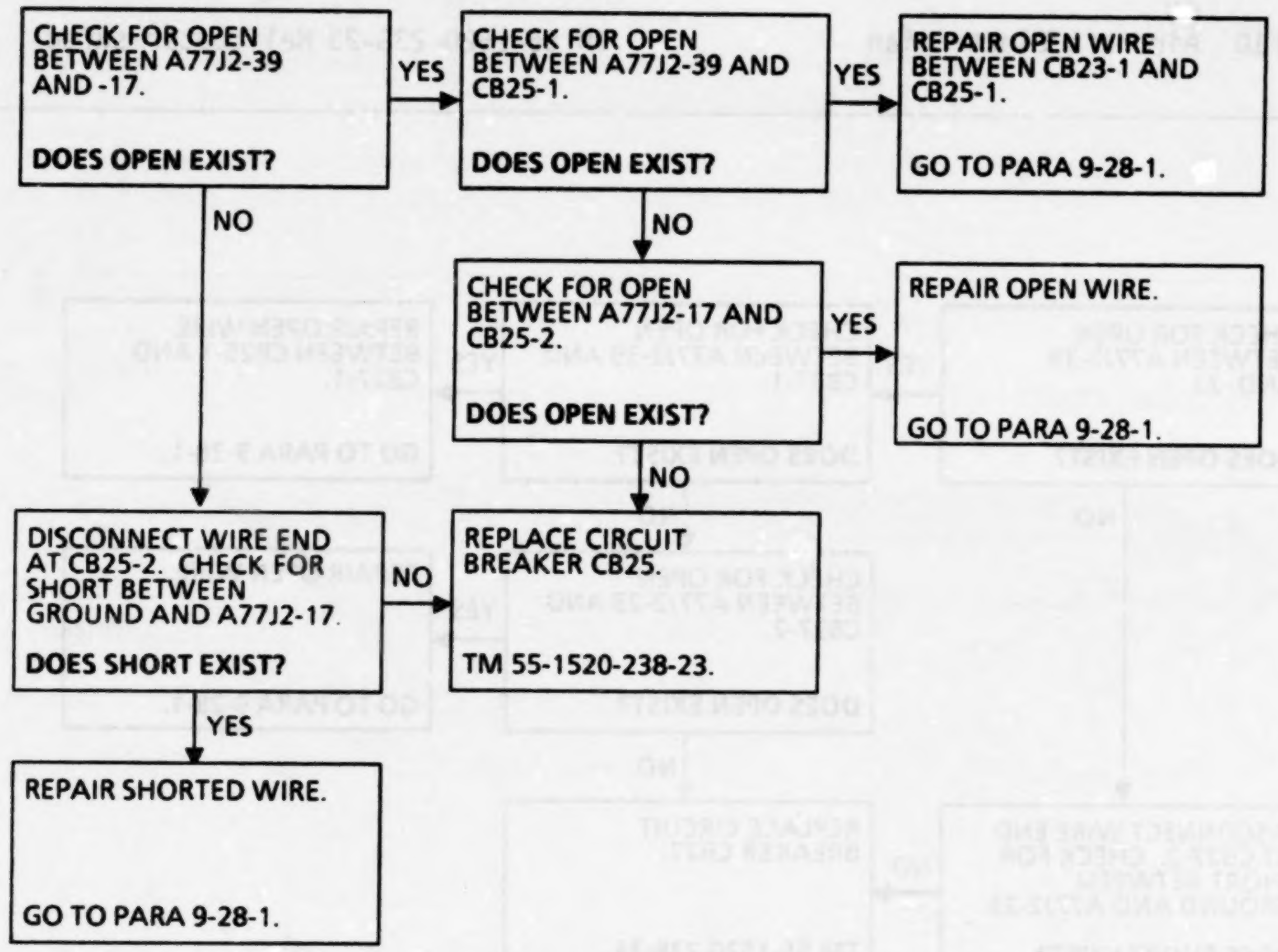
9-28-6. CONTINUITY BETWEEN A77J2-39 AND -17 - DOES NOT EXIST OR SHORT TO LAUNCHER SEEKER NO. 1 EXISTS BETWEEN GROUND AND A77J2-17

Tools: (para 9-28-4)

Personnel Required: (para 9-28-4)

References: (para 9-28-4)

Equipment Conditions: (para 9-28-5)


CHECK FOR OPEN BETWEEN A77J2-39 AND -17.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB25-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN CB23-1 AND CB25-1.
GO TO PARA 9-28-1.
NO
CHECK FOR OPEN BETWEEN A77J2-17 AND CB25-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
REPLACE CIRCUIT BREAKER CB25.
TM 55-1520-238-23.
NO
DISCONNECT WIRE END AT CB25-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-17.
DOES SHORT EXIST?
NO
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-28-1.

END OF TASK

9-28-7. CONTINUITY BETWEEN A77J2-39 AND -20 - DOES NOT EXIST OR SHORT TO EJECTOR RCCB EXISTS BETWEEN GROUND AND A77J2-23

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

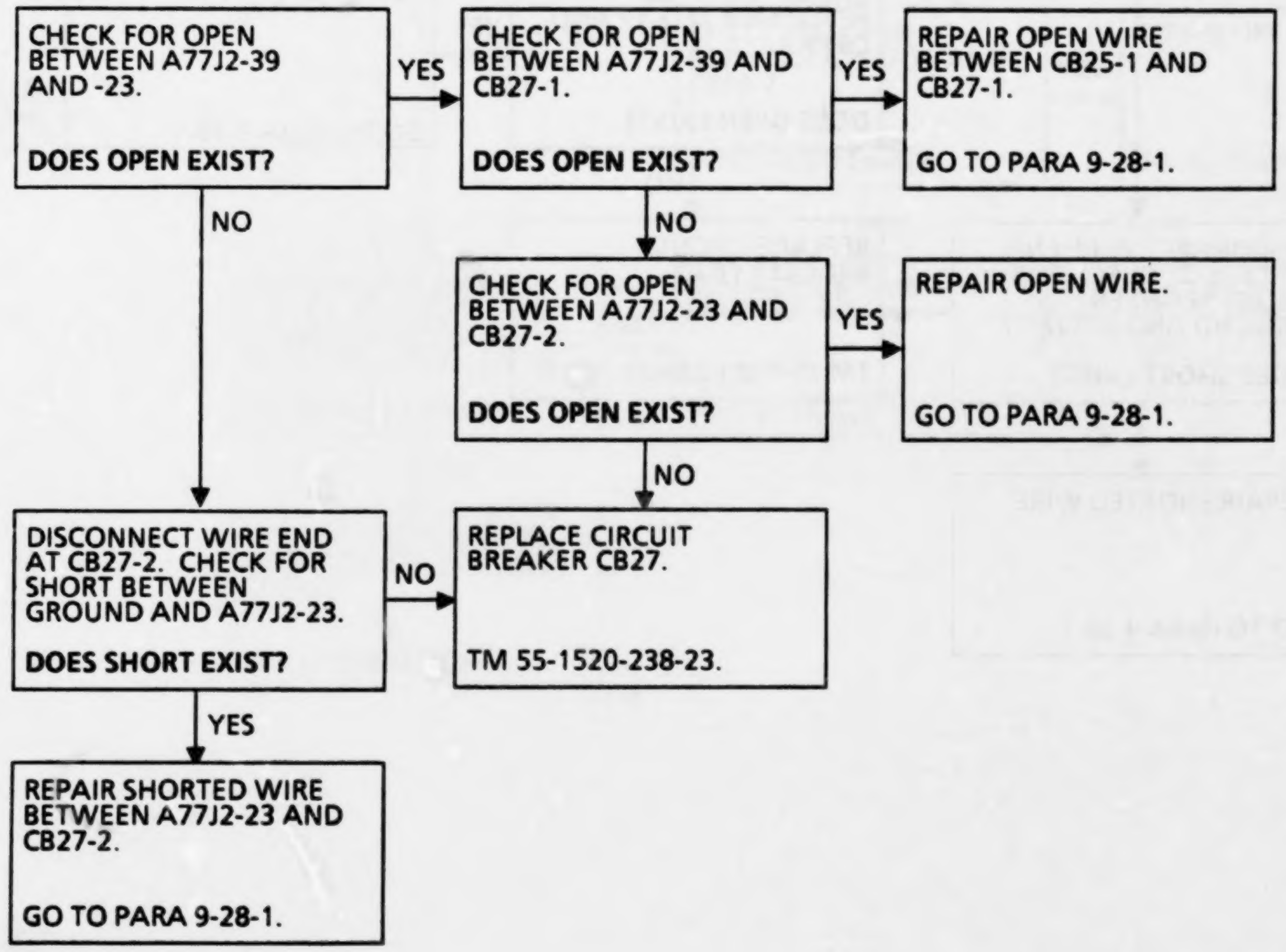
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CHECK FOR OPEN BETWEEN A77J2-39 AND -23.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB27-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN CB25-1 AND CB27-1.
GO TO PARA 9-28-1.
NO
CHECK FOR OPEN BETWEEN A77J2-23 AND CB27-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
NO
DISCONNECT WIRE END AT CB27-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-23.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB27.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN A77J2-23 AND CB27-2.
GO TO PARA 9-28-1.

END OF TASK

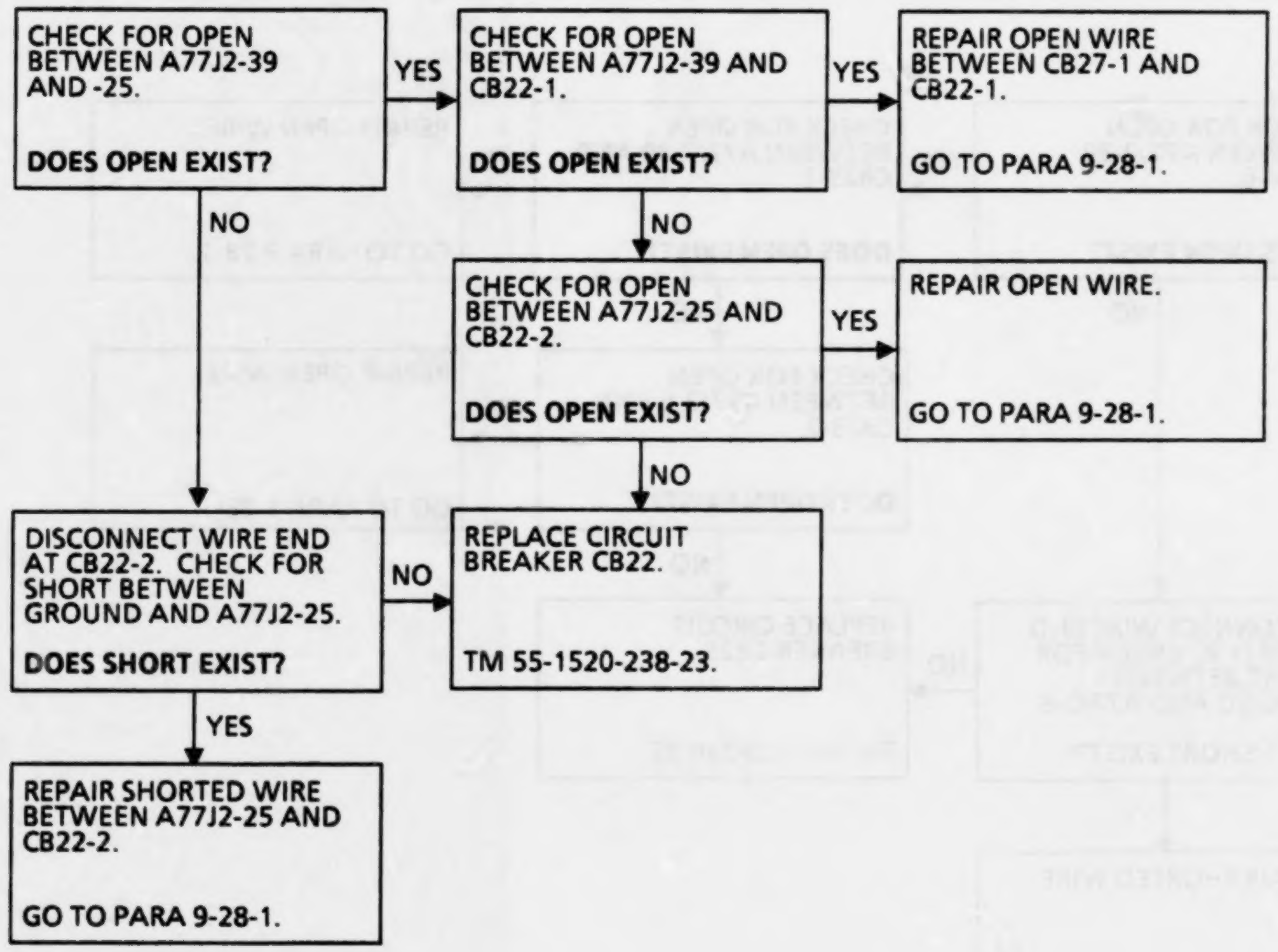
9-28-8. CONTINUITY BETWEEN A77J2-39 AND -25 - DOES NOT EXIST OR SHORT TO LAUNCHER SEEKER NO. 3 EXISTS BETWEEN GROUND AND A77J2-25

Tools: (para 9-28-7)

Personnel Required: (para 9-28-7)

References: (para 9-28-7)

Equipment Conditions: (para 9-28-7)


CHECK FOR OPEN BETWEEN A77J2-39 AND -25.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB22-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN CB27-1 AND CB22-1.
GO TO PARA 9-28-1.
NO
CHECK FOR OPEN BETWEEN A77J2-25 AND CB22-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
NO
DISCONNECT WIRE END AT CB22-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-25.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB22.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN A77J2-25 AND CB22-2.
GO TO PARA 9-28-1.

END OF TASK

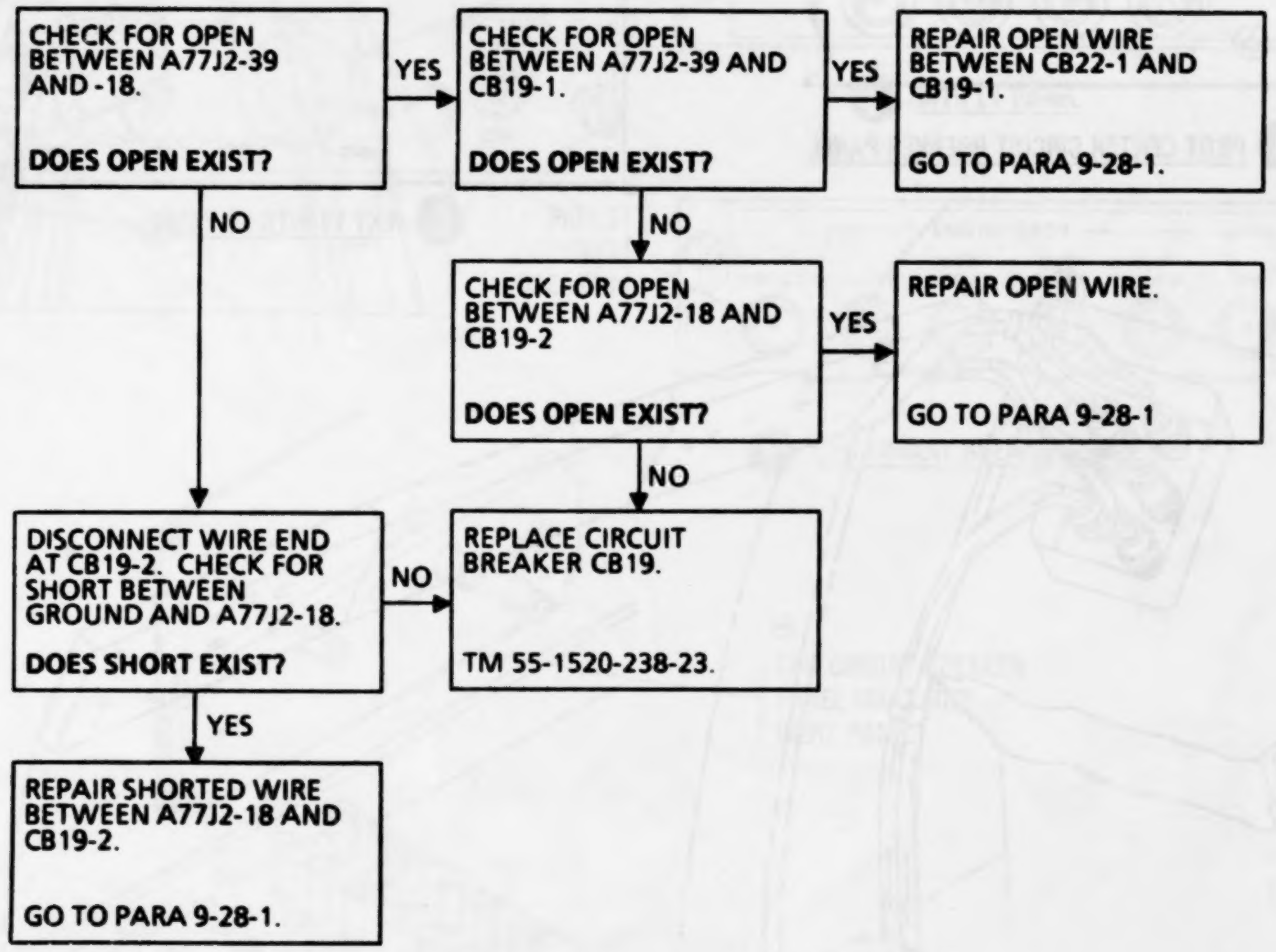
9-28-9. CONTINUITY BETWEEN A77J2-39 AND -18 - DOES NOT EXIST OR SHORT TO LAUNCHER SEEKER NO. 4 EXISTS BETWEEN GROUND AND A77J2-18

Tools: (para 9-28-7)

Personnel Required: (para 9-28-7)

References: (para 9-28-7)

Equipment Conditions: (para 9-28-7)


CHECK FOR OPEN BETWEEN A77J2-39 AND -18.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB19-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN CB22-1 AND CB19-1.
GO TO PARA 9-28-1.
NO
NO
CHECK FOR OPEN BETWEEN A77J2-18 AND CB19-2
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1
NO
DISCONNECT WIRE END AT CB19-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-18.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB19.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN A77J2-18 AND CB19-2.
GO TO PARA 9-28-1.

END OF TASK

9-29-1. CIRCUIT BREAKER EDGE-LIGHT PANEL - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

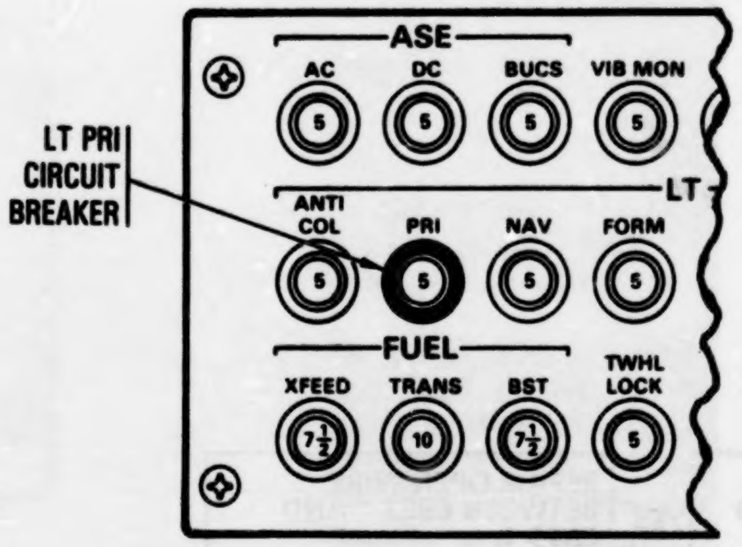
68F10 Aircraft Electrician

References:

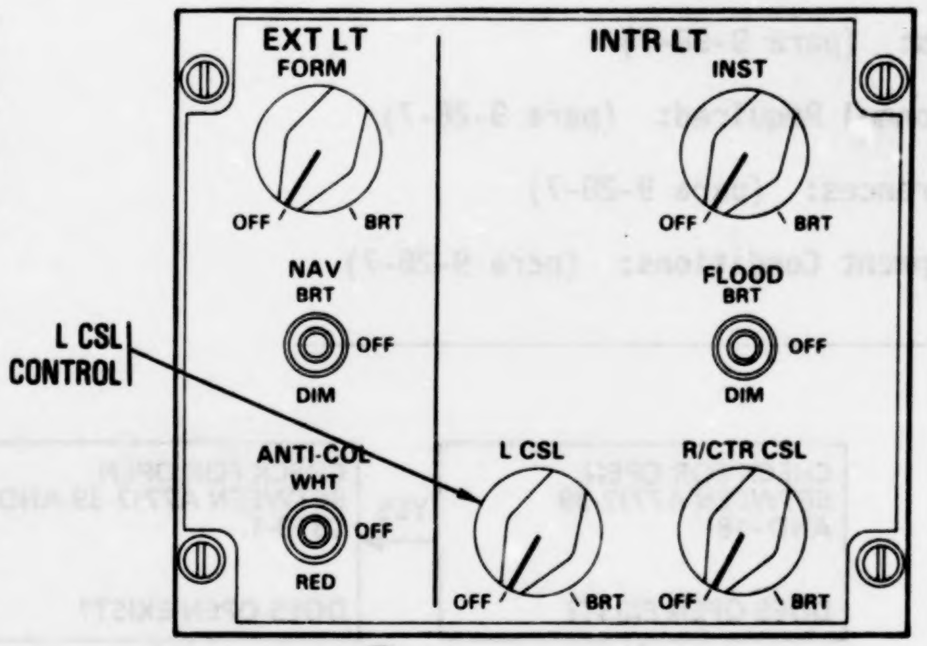
TM 55-1520-238-23

Equipment Conditions:

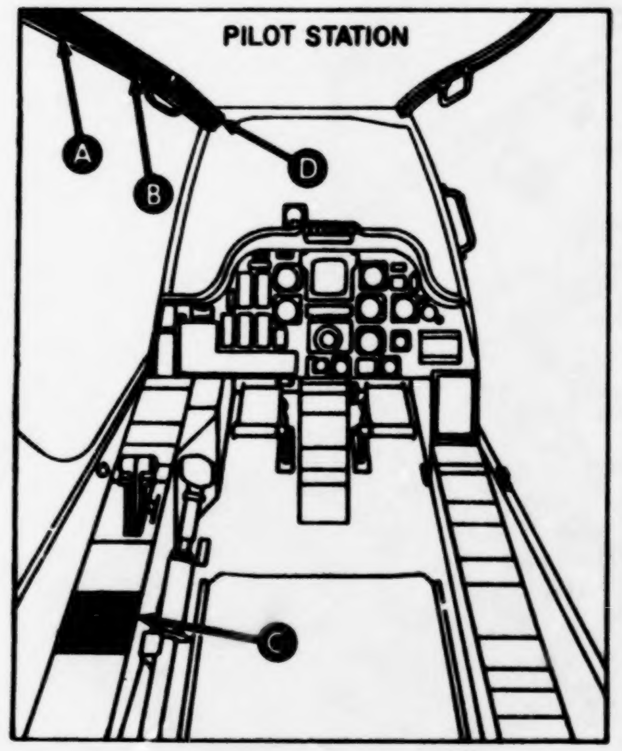
Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

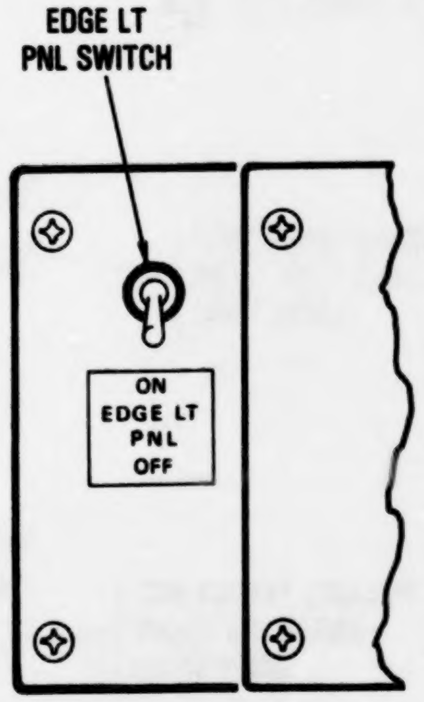

LT PRI CIRCUIT BREAKER
ASE
AC
DC
BUCS
VIB MON
LT
ANTI COL
PRI
NAV
FORM
FUEL
XFEED
TRANS
BST
TWHL LOCK
5
5
5
5
5
5
5
5
7½
10
7½
5

Ⓑ PILOT CENTER CIRCUIT BREAKER PANEL

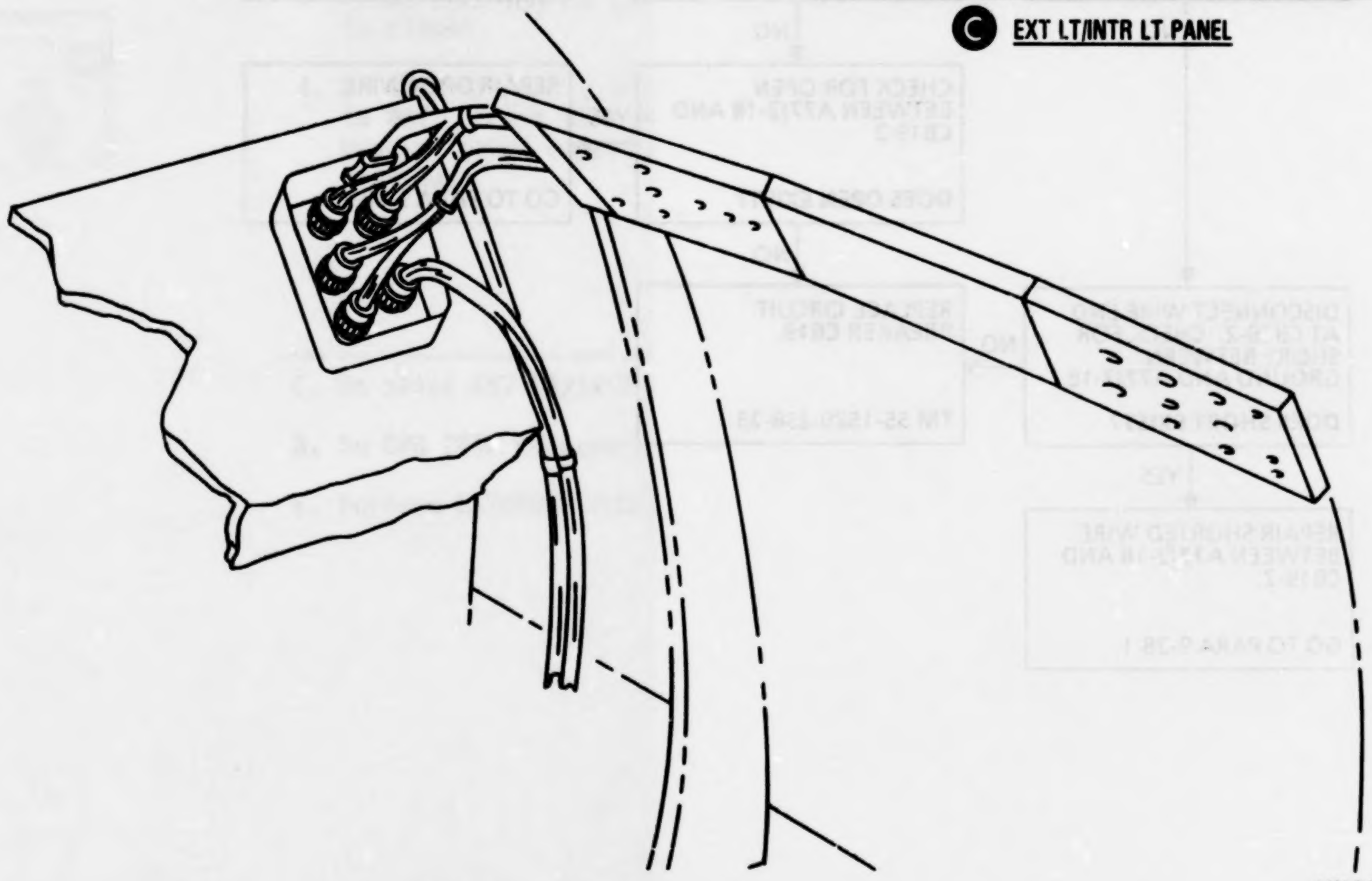

L CSL CONTROL
EXT LT
FORM
OFF
BRT
NAV
BRT
OFF
DIM
ANTI-COL
WHT
OFF
RED
INTR LT
INST
OFF
BRT
FLOOD
BRT
OFF
DIM
L CSL
OFF
BRT
R/CTR CSL
OFF
BRT

Ⓒ EXT LT/INTR LT PANEL


PILOT STATION
A
B
D
C


EDGE LT PNL SWITCH
ON
EDGE LT
PNL
OFF

Ⓐ PILOT AFT CIRCUIT BREAKER PANEL

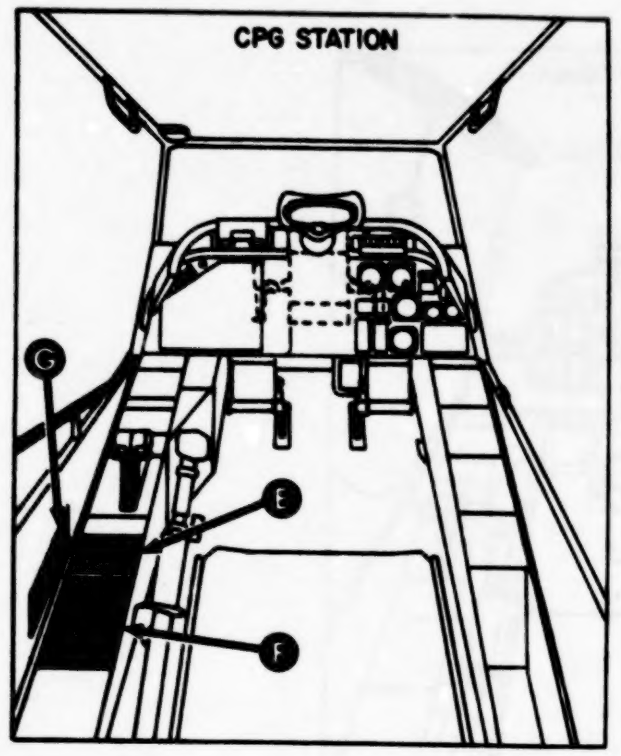


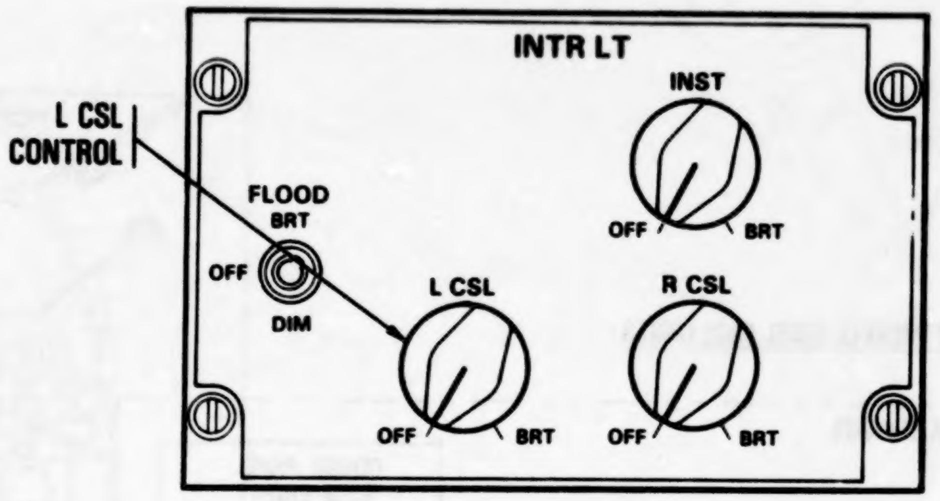
Ⓓ PILOT CIRCUIT BREAKER EDGE-LIGHT PANELS

MM04/1-1231-1

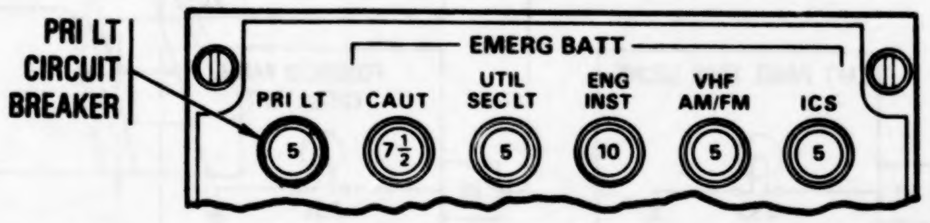
GO TO NEXT PAGE

9-29-1. CIRCUIT BREAKER EDGE-LIGHT PANEL - OPERATIONAL CHECK (cont)

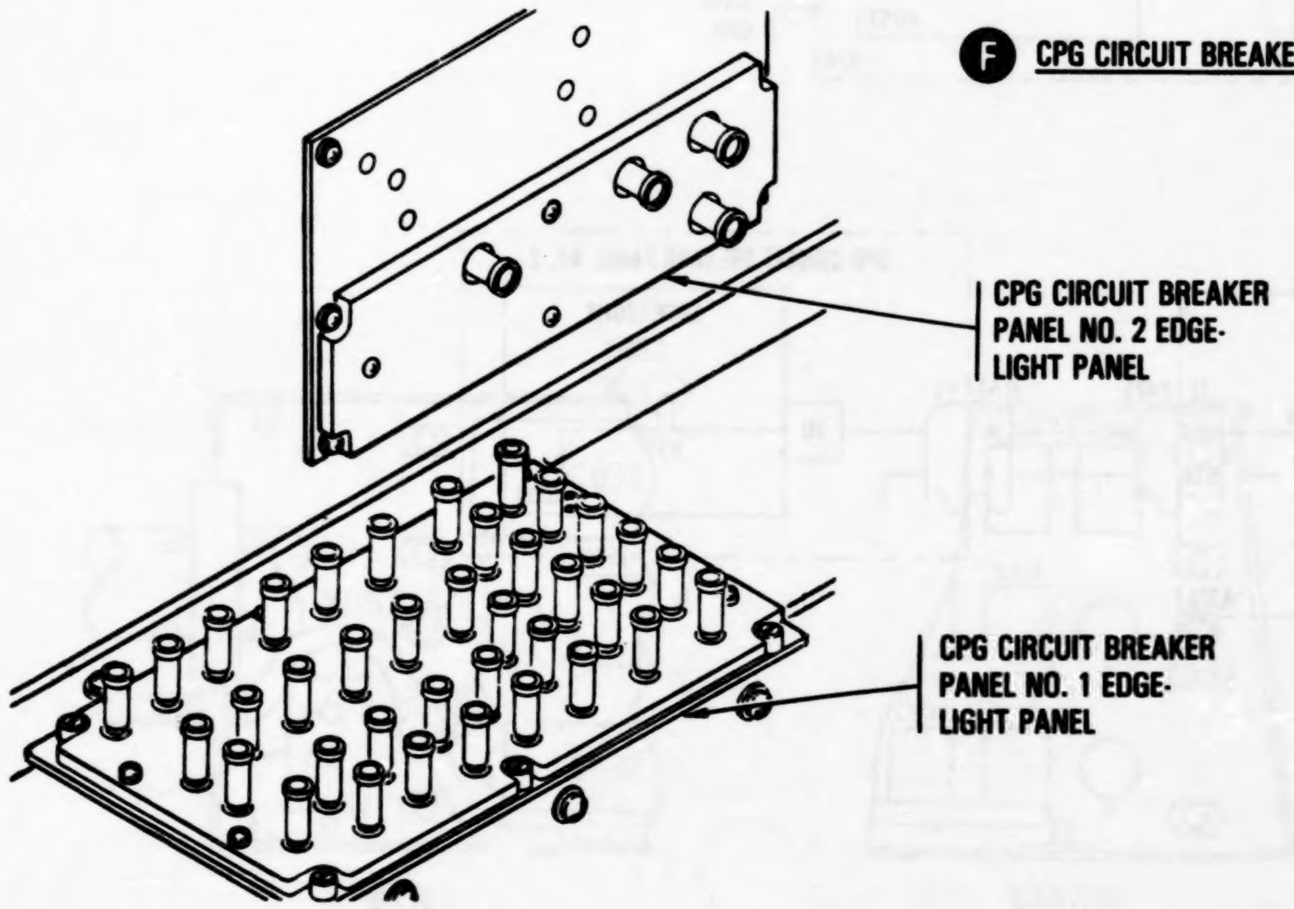

CPG STATION
G
E
F


L CSL CONTROL
INTR LT
INST
FLOOD
BRT
OFF
DIM
OFF
BRT
L CSL
R CSL
OFF
BRT
OFF
BRT

Ⓔ INTR LT PANEL


PRI LT CIRCUIT BREAKER
EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5

Ⓕ CPG CIRCUIT BREAKER PANEL NO. 1


CPG CIRCUIT BREAKER PANEL NO. 2 EDGE-LIGHT PANEL
CPG CIRCUIT BREAKER PANEL NO. 1 EDGE-LIGHT PANEL

Ⓖ CPG CIRCUIT BREAKER EDGE-LIGHT PANELS

MM04/1231-2A

A. On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR switch to EXT PWR.

B. Complete operational check as follows:

TASK	RESULT
1. On pilot center circuit breaker panel, check that LT PRI circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-13-1.
2. On pilot aft circuit breaker panel, set EDGE LT PNL switch to ON. On EXT LT/INTR LT panel, turn L CSL control to BRT. Check that all three circuit breaker edge-light panels are lighted.	Replace unlighted panel lamps (TM 55-1520-238-23). If all three pilot circuit breaker edge-light panels are not lighted, go to para 9-29-4.
3. On CPG circuit breaker panel No. 1, check that PRI LT circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-14-1.
4. On INTR LT panel, set L CSL control to BRT. Cehck that both CPG circuit breaker panel edge-light panels are lighted.	Replace unlighted panel lamps (TM 55-1520-238-23). If CPG circuit breaker panel no. 1 is not lighted, go to para 9-29-5. If CPG circuit breaker panel no. 2 is not lighted, go to para 9-29-6.

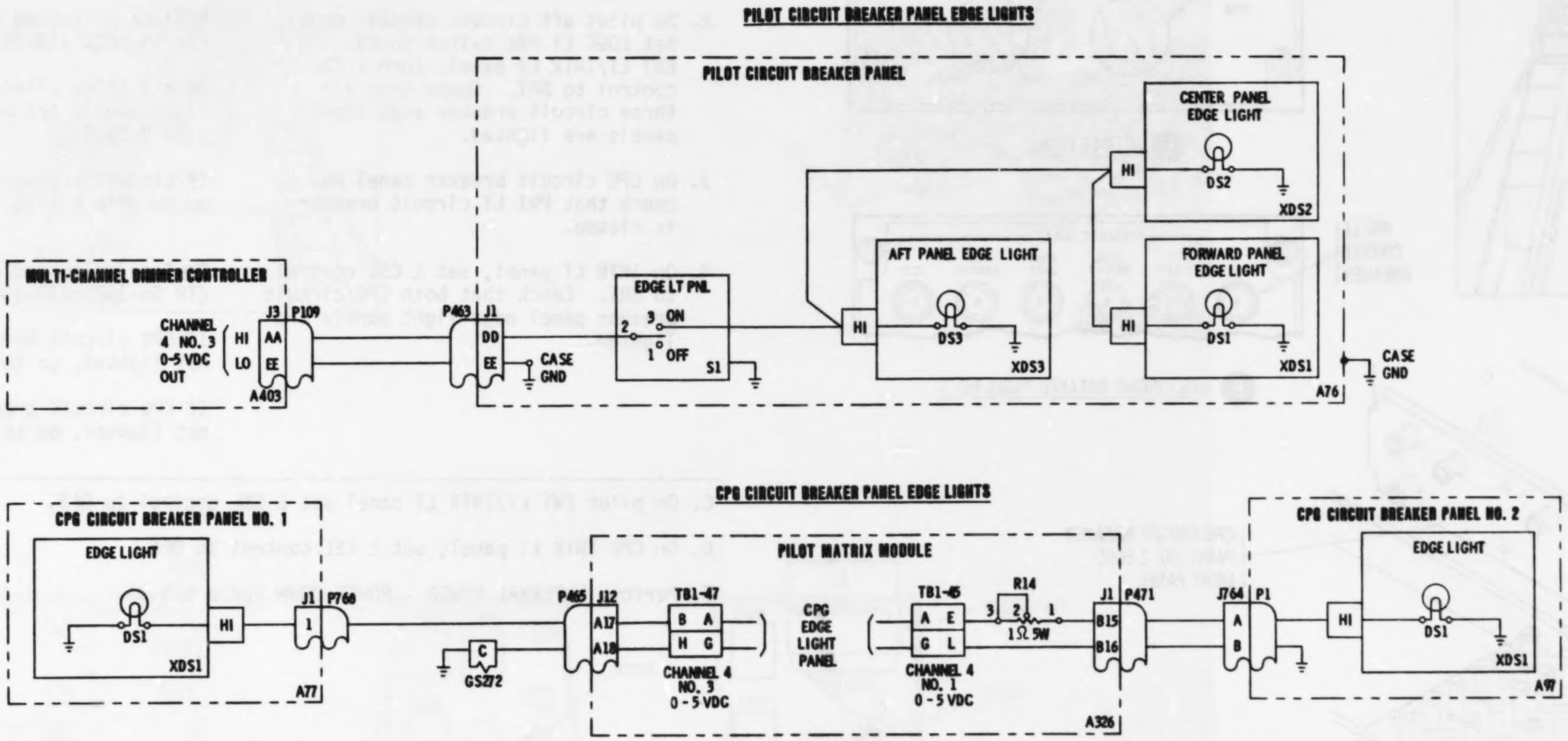
C. On pilot EXT LT/INTR LT panel set L CSL control to OFF.

D. On CPG INTR LT panel, set L CSL control to OFF.

E. Perform EXTERNAL POWER - POWER DOWN (para 9-5-3).

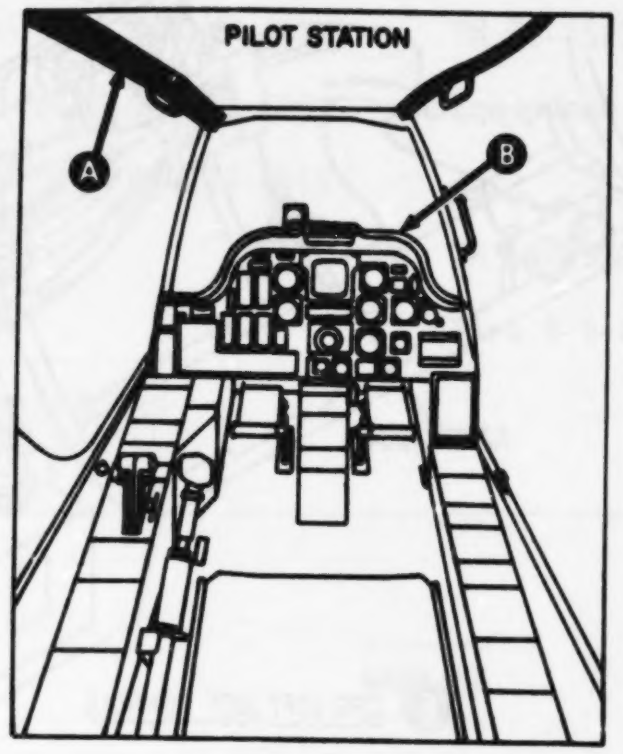
END OF TASK

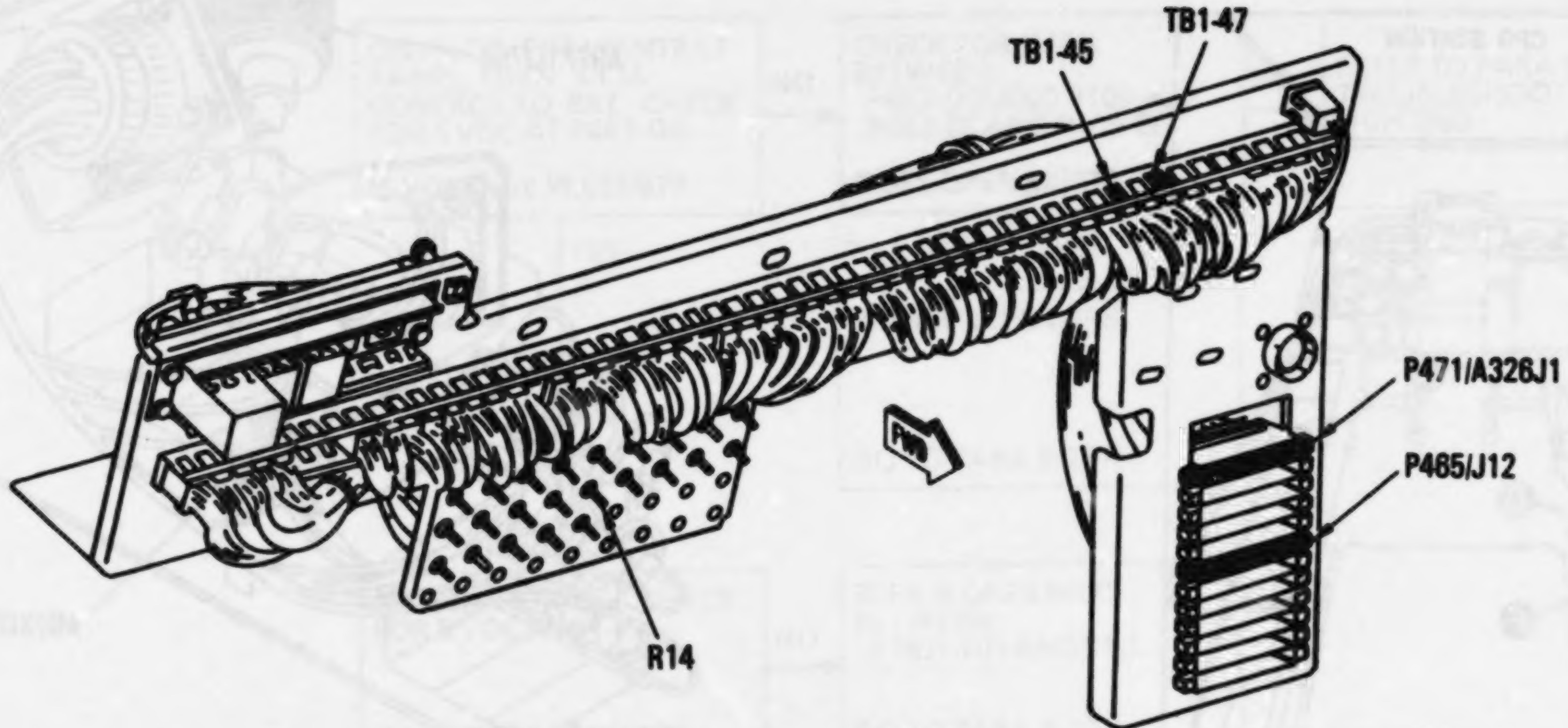
9-29-2. CIRCUIT BREAKER EDGE-LIGHT PANELS - INTERCONNECTION DIAGRAM


PILOT CIRCUIT BREAKER PANEL EDGE LIGHTS
PILOT CIRCUIT BREAKER PANEL
CENTER PANEL EDGE LIGHT
HI
DS2
XDS2
AFT PANEL EDGE LIGHT
HI
DS3
XDS3
FORWARD PANEL EDGE LIGHT
HI
DS1
XDS1
A76
CASE GND
MULTI-CHANNEL DIMMER CONTROLLER
CHANNEL 4 NO. 3 0-5 VDC OUT
HI
LO
J3
P109
AA
EE
A403
P463
J1
DD
EE
CASE GND
EDGE LT PNL
2
3 ON
1 OFF
S1
CPG CIRCUIT BREAKER PANEL EDGE LIGHTS
CPG CIRCUIT BREAKER PANEL NO. 1
EDGE LIGHT
DS1
HI
XDS1
J1
P766
1
A77
C
GS272
P465
J12
A17
A18
PILOT MATRIX MODULE
TB1-47
B A
H G
CHANNEL 4 NO. 3 0 - 5 VDC
CPG EDGE LIGHT PANEL
TB1-45
A E
G L
CHANNEL 4 NO. 1 0 - 5 VDC
R14
3
2
1
1Ω 5W
J1
P471
B15
B16
A326
J764
P1
A
B
CPG CIRCUIT BREAKER PANEL NO. 2
EDGE LIGHT
HI
DS1
XDS1
A97

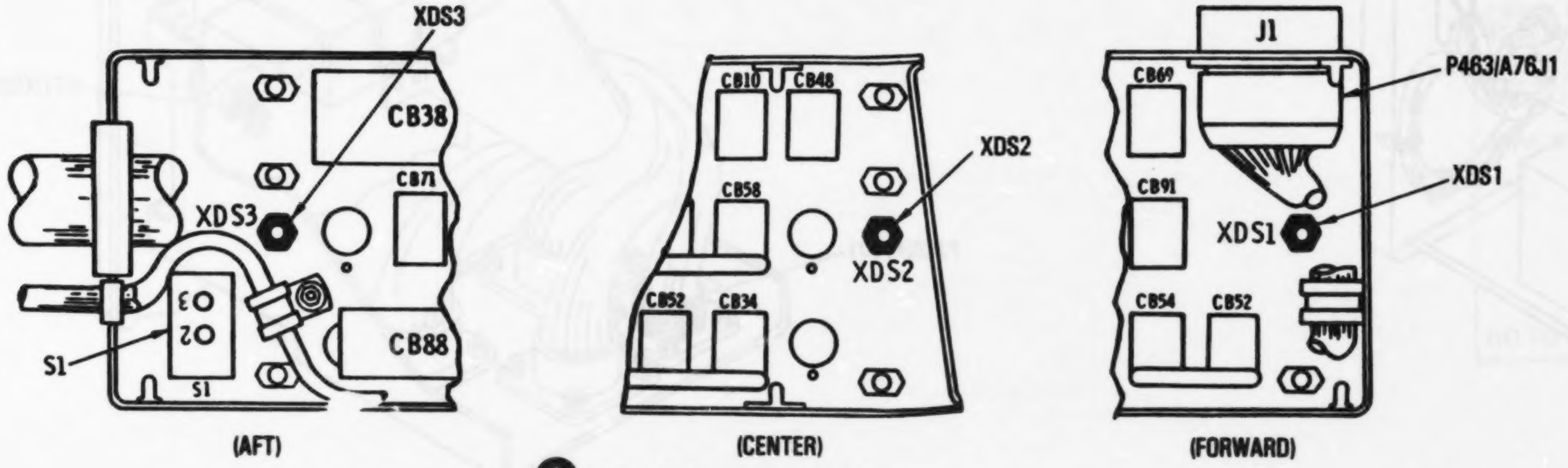
MM04/1-744

9-29-3. CIRCUIT BREAKER EDGE-LIGHT PANELS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


PILOT STATION
A
B


TB1-45
TB1-47
P471/A326J1
P485/J12
FWD
R14

B PILOT MATRIX MODULE

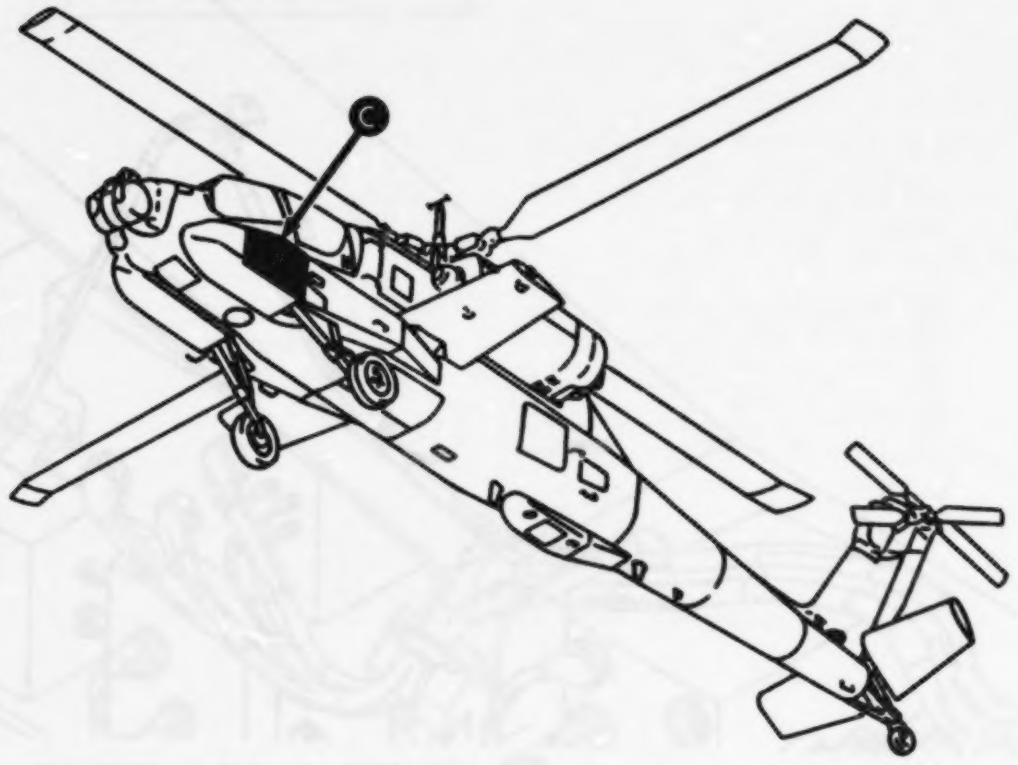

XDS3
CB38
CB71
XDS3
CB88
S1
S1
O3
O2
CB10
CB48
CB58
XDS2
XDS2
CB52
CB34
J1
CB69
P463/A76J1
CB91
XDS1
XDS1
CB54
CB52

(AFT)

(CENTER)

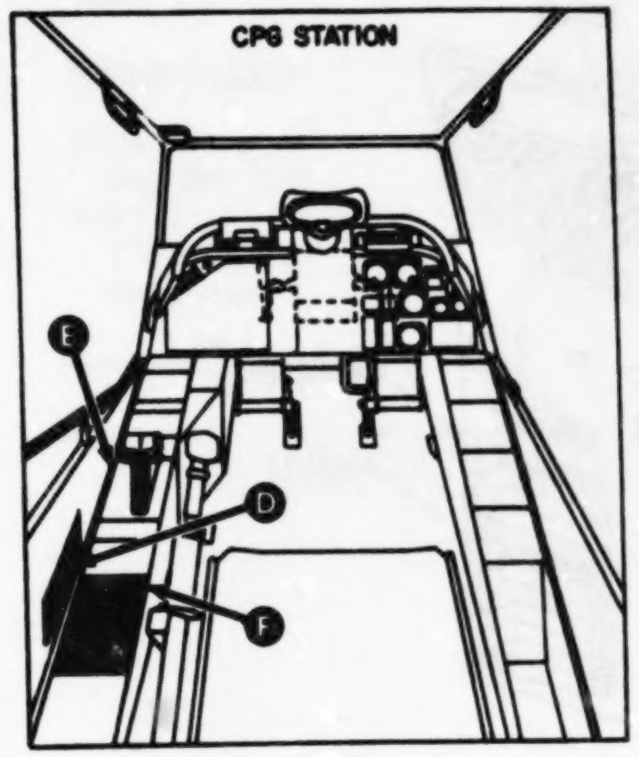
(FORWARD)

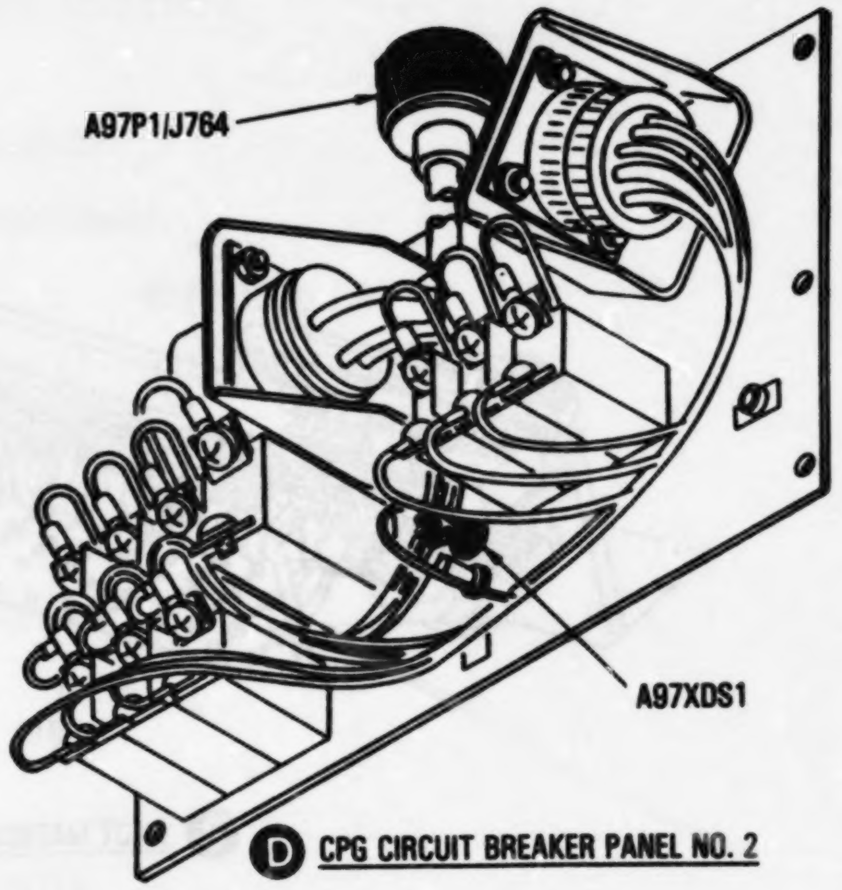
A PILOT CIRCUIT BREAKER PANEL (REAR VIEW)



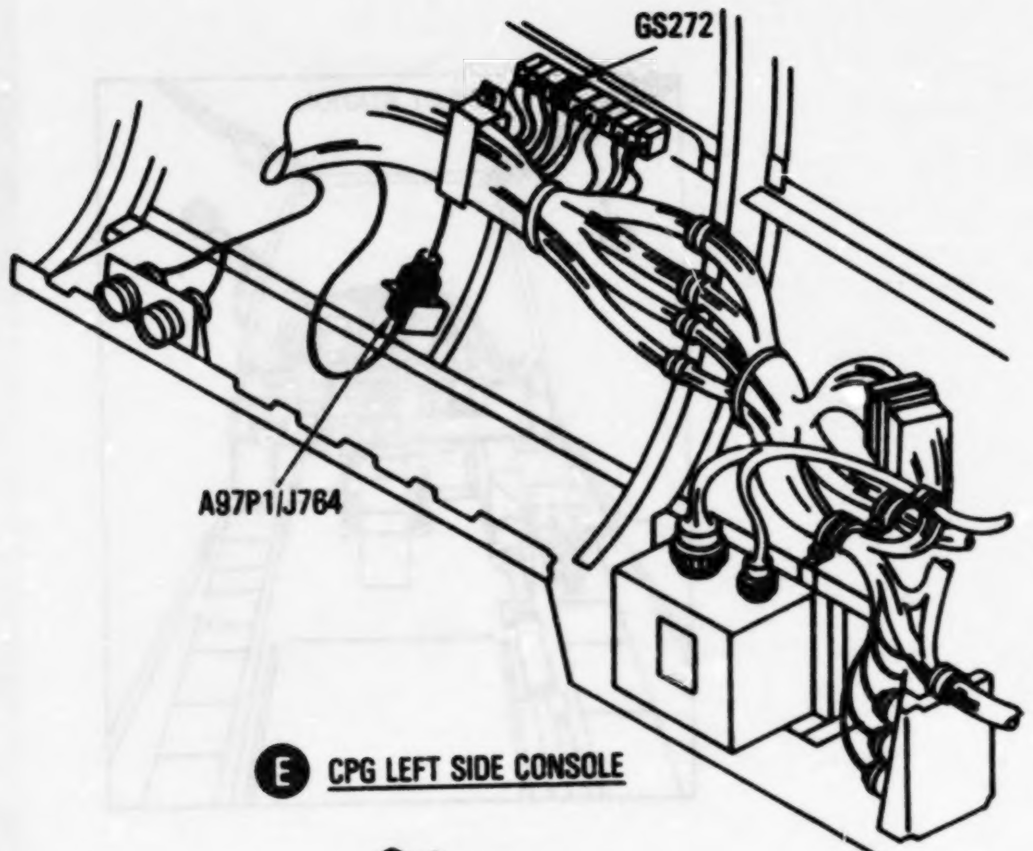
MM04/1-1232-1B

9-29-3. CIRCUIT BREAKER EDGE-LIGHT PANELS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

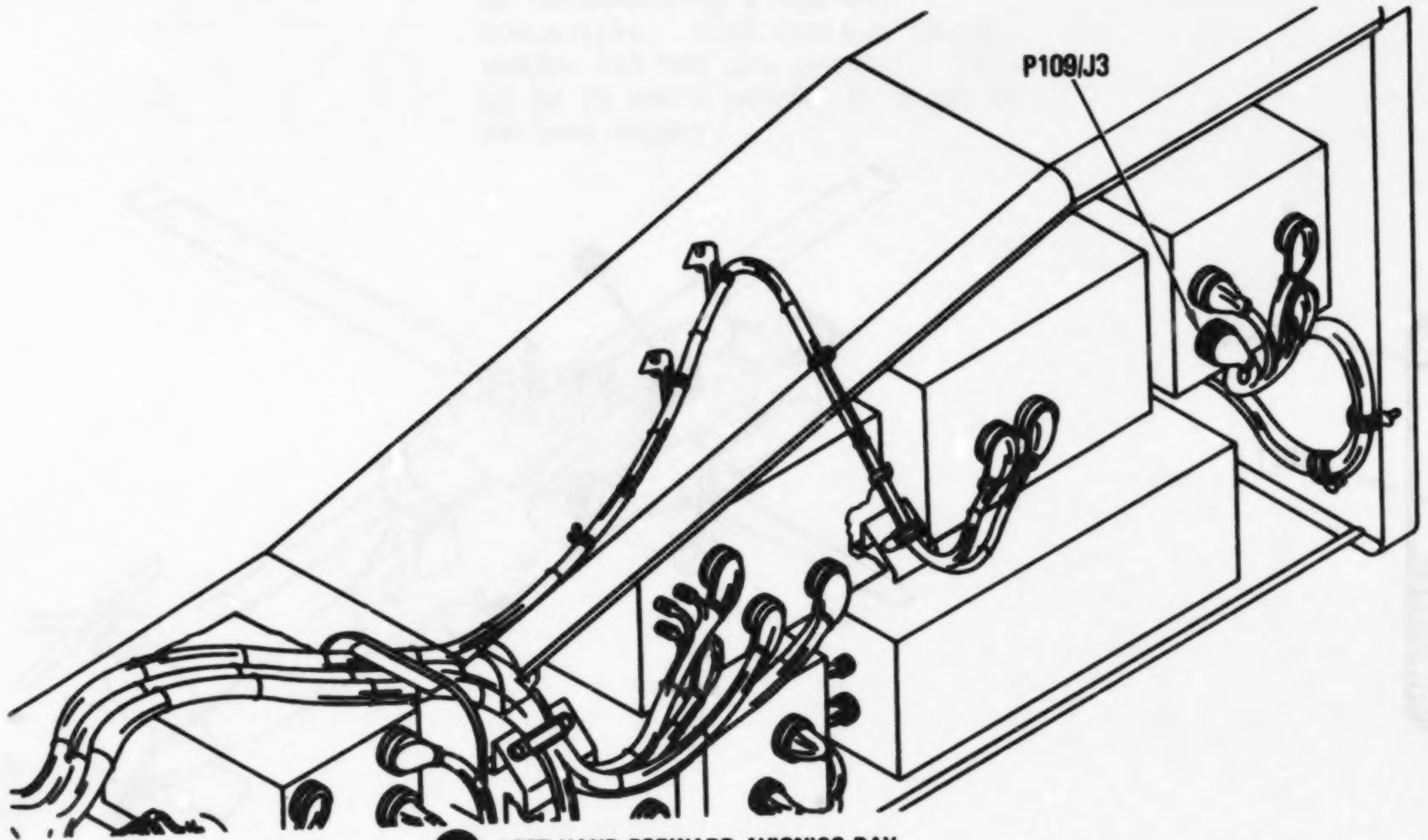

CPG STATION
E
D
F


A97P1/J764
A97XDS1

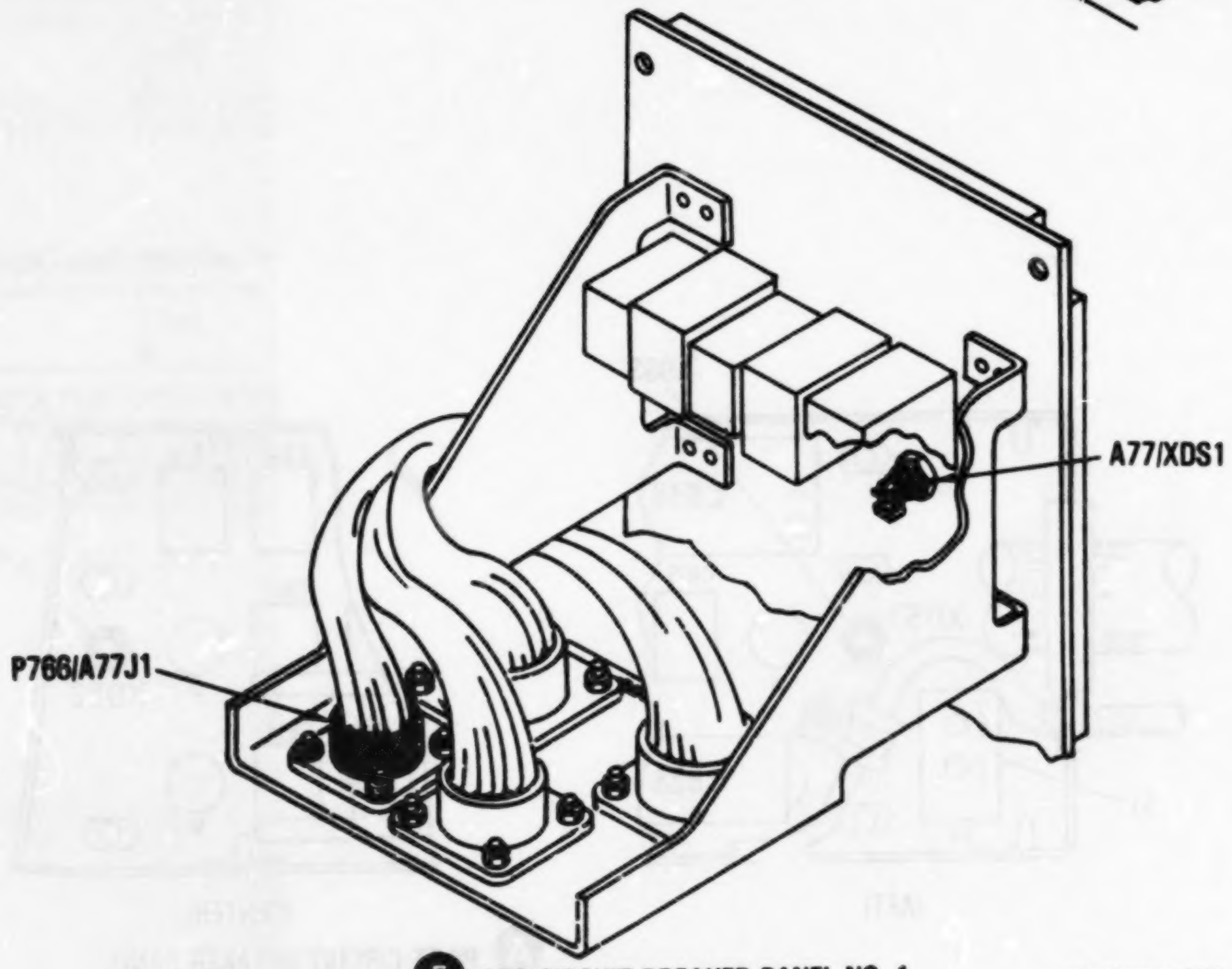
D CPG CIRCUIT BREAKER PANEL NO. 2


GS272
A97P1/J764

E CPG LEFT SIDE CONSOLE



C LEFT HAND FORWARD AVIONICS BAY


A77/XDS1
P768/A77J1

F CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1232-2B

9-29-4. PILOT CIRCUIT BREAKER EDGE-LIGHT PANELS - DO NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

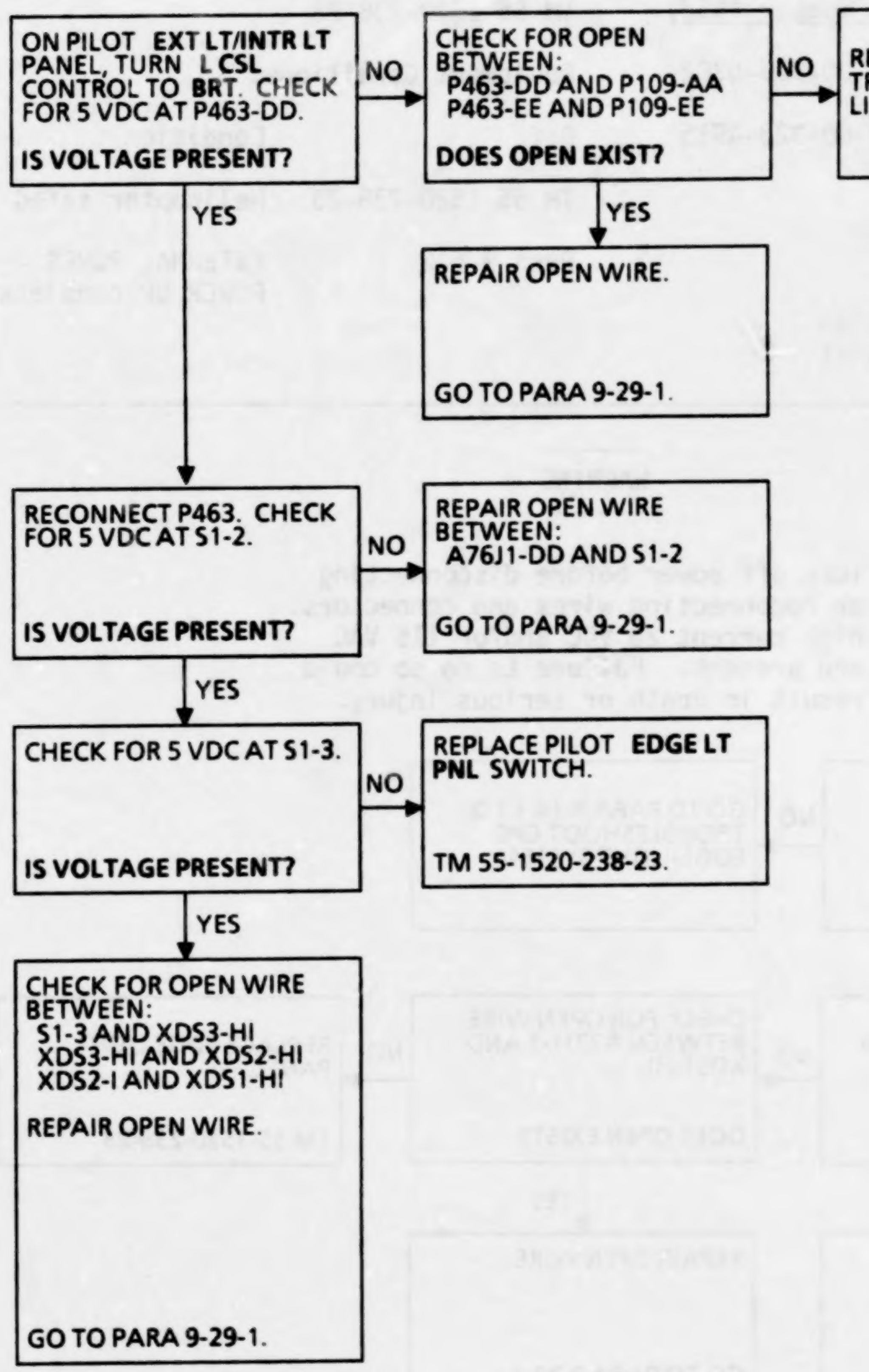
TM 55-15200-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON PILOT EXT LT/INTR LT PANEL, TURN L CSL CONTROL TO BRT. CHECK FOR 5 VDC AT P463-DD.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN:
P463-DD AND P109-AA
P463-EE AND P109-EE
DOES OPEN EXIST?
NO
REFER TO PARA 9-13-1 TO TROUBLESHOOT INTERIOR LIGHTING.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-29-1.
YES
RECONNECT P463. CHECK FOR 5 VDC AT S1-2.
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN:
A76J1-DD AND S1-2
GO TO PARA 9-29-1.
YES
CHECK FOR 5 VDC AT S1-3.
IS VOLTAGE PRESENT?
NO
REPLACE PILOT EDGE LT PNL SWITCH.
TM 55-1520-238-23.
YES
CHECK FOR OPEN WIRE BETWEEN:
S1-3 AND XDS3-HI
XDS3-HI AND XDS2-HI
XDS2-I AND XDS1-HI
REPAIR OPEN WIRE.
GO TO PARA 9-29-1.

END OF TASK

9-29-5. CPG CIRCUIT BREAKER PANEL NO. 1 EDGE-LIGHT - DOES NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

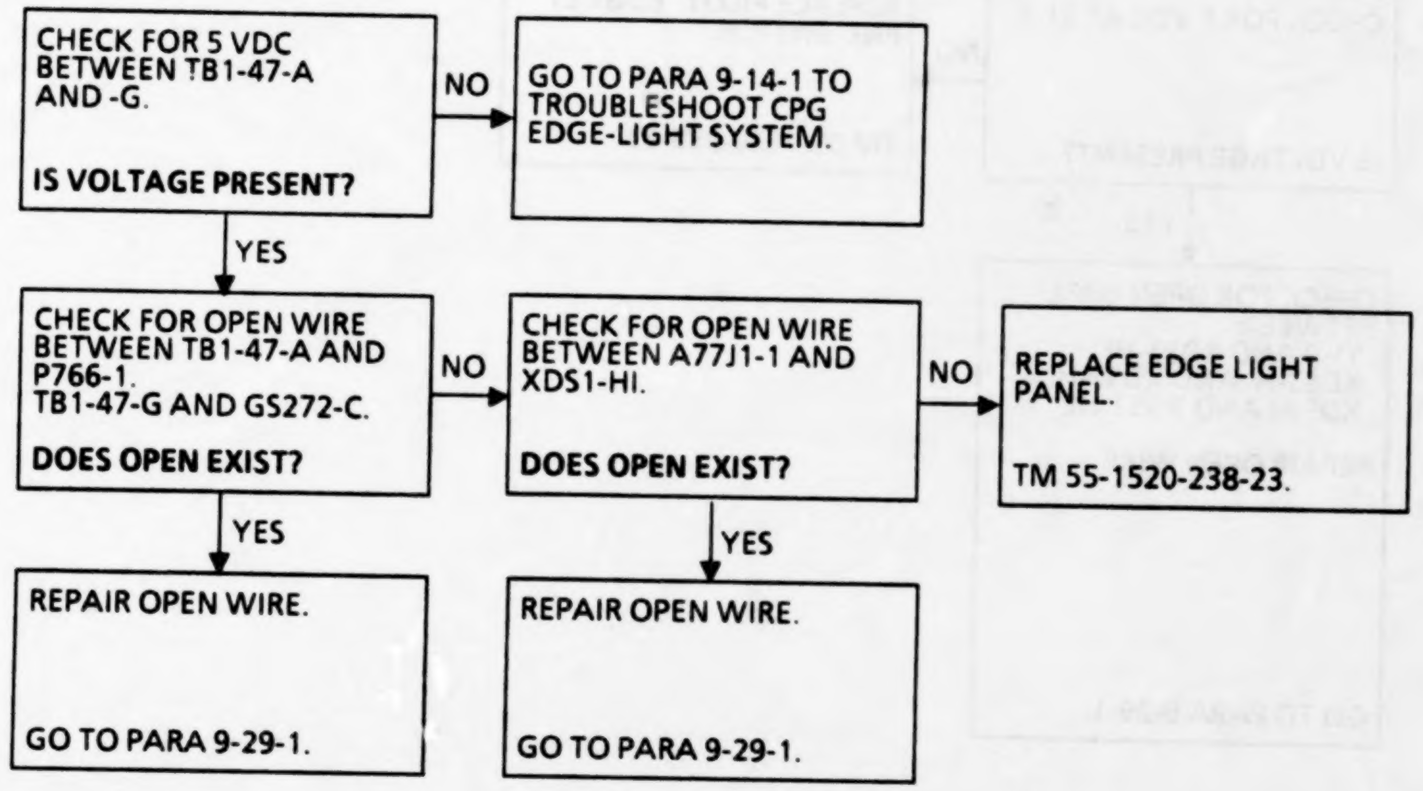
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-47-A AND -G.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-14-1 TO TROUBLESHOOT CPG EDGE-LIGHT SYSTEM.
YES
CHECK FOR OPEN WIRE BETWEEN TB1-47-A AND P766-1. TB1-47-G AND GS272-C.
DOES OPEN EXIST?
NO
CHECK FOR OPEN WIRE BETWEEN A77J1-1 AND XDS1-HI.
DOES OPEN EXIST?
NO
REPLACE EDGE LIGHT PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-29-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-29-1.

END OF TASK

9-29-6. CPG CIRCUIT BRAKER PANEL NO. 2 EDGE-LIGHT - DOES NOT LIGHT

Tools: (para 9-29-5)

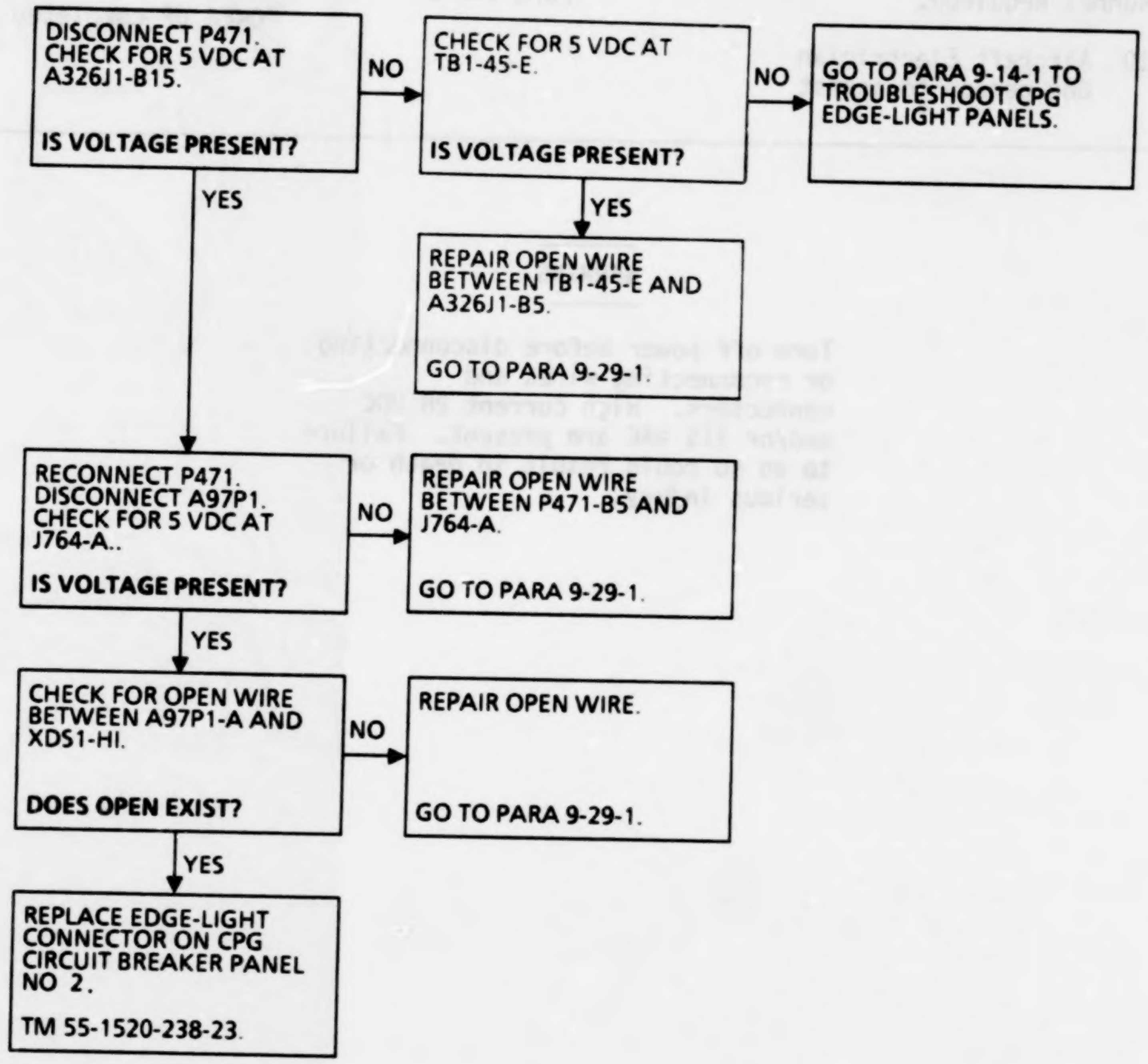
Personnel Required: (para 9-29-5)

References: (para 9-29-5)

Equipment Conditions: (para 9-29-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P471. CHECK FOR 5 VDC AT A326J1-B15.
IS VOLTAGE PRESENT?
NO
CHECK FOR 5 VDC AT TB1-45-E.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-14-1 TO TROUBLESHOOT CPG EDGE-LIGHT PANELS.
YES
REPAIR OPEN WIRE BETWEEN TB1-45-E AND A326J1-B5.
GO TO PARA 9-29-1.
YES
RECONNECT P471. DISCONNECT A97P1. CHECK FOR 5 VDC AT J764-A.
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN P471-B5 AND J764-A.
GO TO PARA 9-29-1.
YES
CHECK FOR OPEN WIRE BETWEEN A97P1-A AND XDS1-HI.
DOES OPEN EXIST?
NO
REPAIR OPEN WIRE.
GO TO PARA 9-29-1.
YES
REPLACE EDGE-LIGHT CONNECTOR ON CPG CIRCUIT BREAKER PANEL NO 2.
TM 55-1520-238-23.

END OF TASK

9-30-1. PILOT AND CPG CAUTION/WARNING PANELS - INDICATORS FUNCTIONAL DATA

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

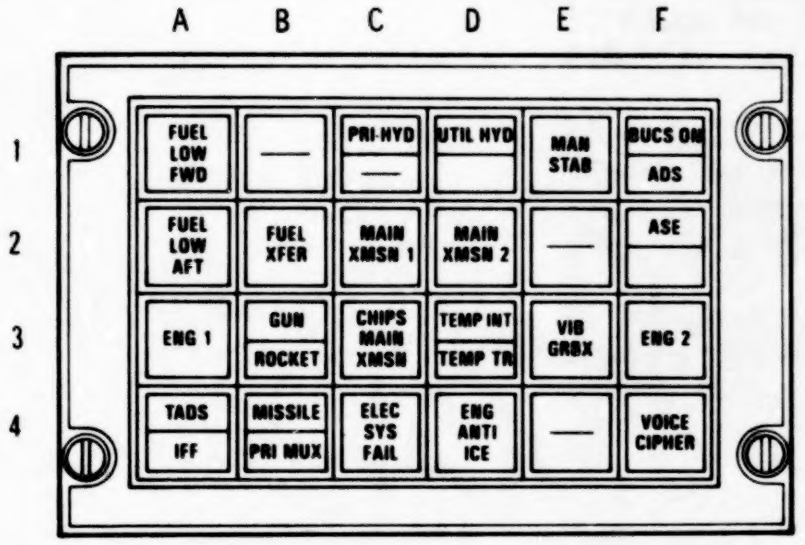
68F10	Aircraft Electrician
	One person to assist

References:

TM 55-1520-238-23

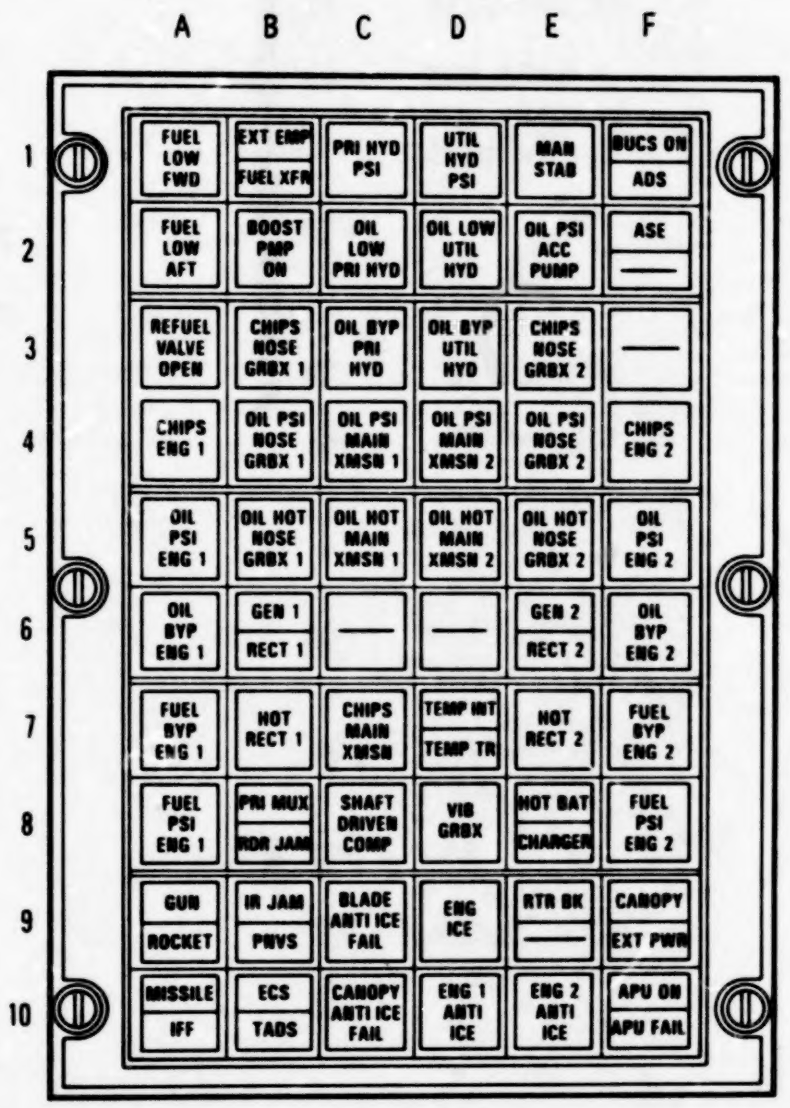
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



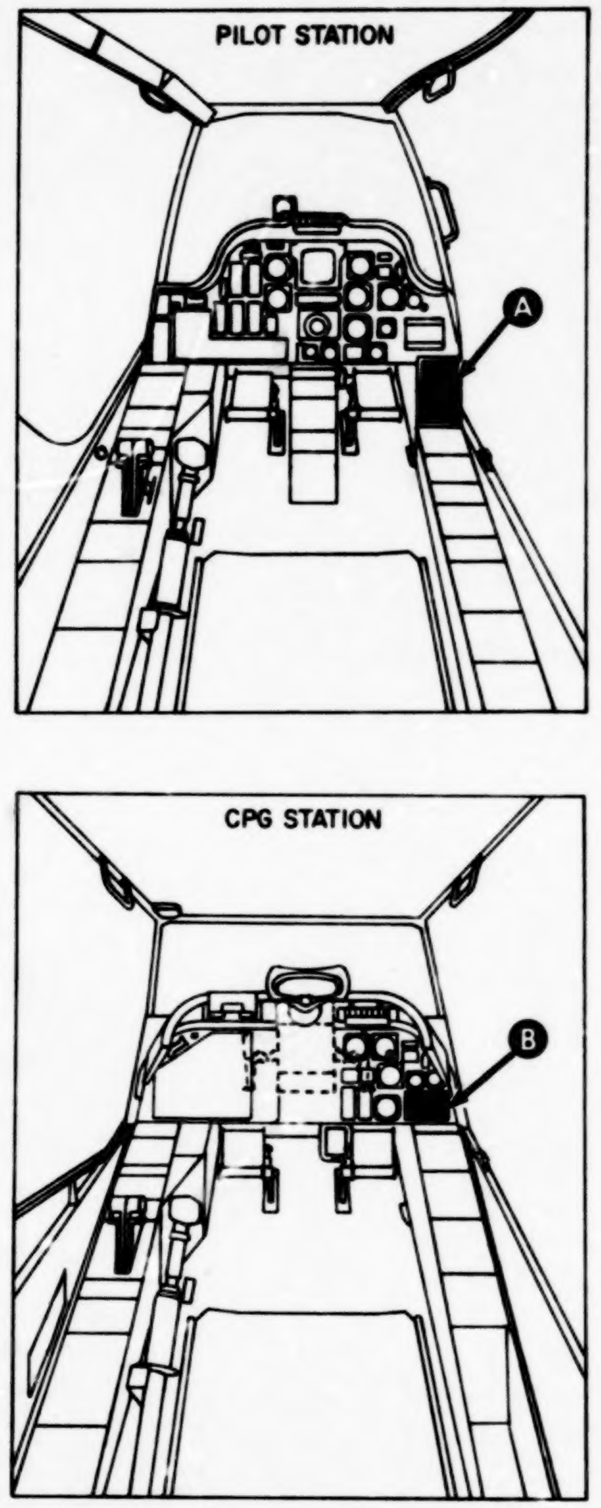
	A	B	C	D	E	F
1	FUEL LOW FWD	—	PRI-HYD —	UTIL HYD	MAN STAB	BUCS ON ADS
2	FUEL LOW AFT	FUEL XFER	MAIN XMSN 1	MAIN XMSN 2	—	ASE
3	ENG 1	GUN ROCKET	CHIPS MAIN XMSN	TEMP INT TEMP TR	VIB GRBX	ENG 2
4	TADS IFF	MISSILE PRI MUX	ELEC SYS FAIL	ENG ANTI ICE	—	VOICE CIPHER

B CPG CAUTION/WARNING PANEL



	A	B	C	D	E	F
1	FUEL LOW FWD	EXT EMP FUEL XFR	PRI HYD PSI	UTIL HYD PSI	MAN STAB	BUCS ON ADS
2	FUEL LOW AFT	BOOST PMP ON	OIL LOW PRI HYD	OIL LOW UTIL HYD	OIL PSI ACC PUMP	ASE —
3	REFUEL VALVE OPEN	CHIPS NOSE GRBX 1	OIL BYP PRI HYD	OIL BYP UTIL HYD	CHIPS NOSE GRBX 2	—
4	CHIPS ENG 1	OIL PSI NOSE GRBX 1	OIL PSI MAIN XMSN 1	OIL PSI MAIN XMSN 2	OIL PSI NOSE GRBX 2	CHIPS ENG 2
5	OIL PSI ENG 1	OIL HOT NOSE GRBX 1	OIL HOT MAIN XMSN 1	OIL HOT MAIN XMSN 2	OIL HOT NOSE GRBX 2	OIL PSI ENG 2
6	OIL BYP ENG 1	GEN 1 RECT 1	—	—	GEN 2 RECT 2	OIL BYP ENG 2
7	FUEL BYP ENG 1	HOT RECT 1	CHIPS MAIN XMSN	TEMP INT TEMP TR	HOT RECT 2	FUEL BYP ENG 2
8	FUEL PSI ENG 1	PRI MUX RDR JAM	SHAFT DRIVEN COMP	VIB GRBX	HOT BAT CHARGER	FUEL PSI ENG 2
9	GUN ROCKET	IR JAM PNVS	BLADE ANTI ICE FAIL	ENG ICE	RTR BK —	CANOPY EXT PWR
10	MISSILE IFF	ECS TADS	CANOPY ANTI ICE FAIL	ENG 1 ANTI ICE	ENG 2 ANTI ICE	APU ON APU FAIL

A PILOT CAUTION/WARNING PANEL



MMD4/1-1032A

GO TO NEXT PAGE

9-30-1. PILOT AND CPG CAUTION/WARNING PANELS - INDICATORS FUNCTIONAL DATA (cont)

A. Use the caution/warning functional data as follows:

TASK	RESULT
1. On pilot caution/warning panel, remove P18. Apply input signal to pilot panel input pin numbers. EXAMPLE: For ASE indicator (pilot lamp key F2), supply ground at pin J1-46. Check that ASE indicator is lighted.	If indicator does not light, replace lamp(s) (TM 55-1520-238-23). Apply input signal to pin. Check that indicator is lighted. If replaced lamp(s) do not light, replace pilot caution/warning panel (TM 55-1520-238-23).
2. On CPG caution/warning panel, apply input signals through P18 pins to indicators that receive input signals from pilot caution/warning panel. EXAMPLE: For IFF indicator (CPG lamp key A4), apply 28 VDC at pin P18-117. Check that IFF indicator is lighted.	If indicator does not light, disconnect P19 from CPG caution/warning panel. Apply input signal to CPG panel input pin. EXAMPLE: For CPG IFF indicator, apply 28 VDC at J1-1. Check that IFF indicator is lighted. If indicator is lighted, check for short or open in wire between pilot panel output pin (P18) and CPG panel input pin (P19). EXAMPLE: For CPG IFF indicator check for open between P18-117 and P19-1, check for short between ground and P18-117. Repair wire. If indicator does not light with input signal applied directly to CPG panel, replace lamp(s). Apply input signal to pin, check that indicator is lighted. If replaced lamp(s) do not light, replace CPG caution/warning panel (TM 55-1520-238-23).

PILOT LAMP KEY	PILOT INDICATOR LEGEND	PILOT PANEL INPUT PIN NO. (P18)	FAULT INPUT SIGNAL (LAMP ON)	PILOT PANEL OUTPUT PIN NO. (P18)	CPG PANEL INPUT PIN NO. (P19)	CPG INDICATOR LEGEND	CPG LAMP KEY
A1	FUEL LOW FWD	J1-21	GROUND	J1-128	J1-21	FUEL LOW FWD	A1
B1	EXT EMP	J1-51	GROUND				
	FUEL XFR	J1-95	GROUND	J1-94	J1-95	FUEL XFER	B2
C1	PRI HYD PSI	J1-71	GROUND	J1-121	J1-71	PRI HYD	C1
D1	UTIL HYD PSI	J1-72	GROUND	J1-122	J1-72	UTIL HYD	D1
E1	MAN STAB	J1-97	GROUND	J1-90	J1-93	MAN STAB	E1
F1	BUCS ON	J1-40	GROUND	J1-114	J1-40	BUCS ON	F1
	ADS	J1-98	+28 VDC	J1-100	J1-98	ADS	
A2	FUEL LOW AFT	J1-22	GROUND	J1-119	J1-22	FUEL LOW AFT	A2
B2	BOOST PUMP ON	J1-96	+28 VDC				
C2	OIL LOW PRI HYD	J1-68	GROUND				
D2	OIL LOW UTIL HYD	J1-67	GROUND				
E2	OIL PSI ACC PUMP	J1-4	GROUND				
F2	ASE	J1-46	GROUND	J1-116	J1-46	ASE	F2
A3	REFUEL VALVE OPEN	J1-76	GROUND				

GO TO NEXT PAGE

9-30-1. PILOT AND CPG CAUTION/WARNING PANELS - INDICATORS FUNCTIONAL DATA (cont)

PILOT LAMP KEY	PILOT INDICATOR LEGEND	PILOT PANEL INPUT PIN NO. (P18)	FAULT INPUT SIGNAL (LAMP ON)	PILOT PANEL OUTPUT PIN NO. (P18)	CPG PANEL INPUT PIN NO. (P19)	CPG INDICATOR LEGEND	CPG LAMP KEY
B3	CHIPS NOSE GRBX 1	J1-36	GROUND	J1-103	J1-36	ENG 1	A3
C3	OIL BYP PRI HYD	J1-69	GROUND				
D3	OIL BYP UTIL HYD	J1-70	GROUND				
E3	OIL PSI ACC PUMP	J1-4	GROUND				
A4	CHIPS ENG 1	J1-29	GROUND	J1-58	J1-29	ENG 1	A3
B4	OIL PSI NOSE GRBX 1	J1-44	GROUND	J1-105	J1-44	ENG 1	A3
C4	OIL PSI MAIN XMSN 1	J1-9	GROUND	J1-83	J1-9	MAIN XMSN 1	C2
D4	OIL PSI MAIN XMSN 2	J1-10	GROUND	J1-84	J1-10	MAIN XMSN 2	D2
E4	OIL PSI NOSE GRBX2	J1-45	GROUND	J1-106	J1-45	ENG 2	F3
F4	CHIPS ENG 2	J1-30	GROUND	J1-59	J1-30	ENG 2	F3
A5	OIL PSI ENG 1	J1-7	GROUND	J1-81	J1-7	ENG 1	A3
B5	OIL HOT NOSE GRBX 1	J1-52	GROUND	J1-107	J1-52	ENG 1	A3
C5	OIL HOT MAIN XMSN 1	J1-65	GROUND	J1-109	J1-65	MAIN XMSN 1	C2
D5	OIL HOT MAIN XMSN 2	J1-66	GROUND	J1-110	J1-66	MAIN XMSN 2	D2
E5	OIL HOT NOSE GRBX 2	J1-53	GROUND	J1-108	J1-53	ENG 2	F3
F5	OIL PSI ENG 2	J1-8	GROUND	J1-82	J1-8	ENG 2	F3
A6	OIL BYP ENG 1	J1-17	GROUND	J1-87	J1-17	ENG 1	A3
B6	GEN 1	J1-11	GROUND				
	RECT 1	J1-15	GROUND	J1-20	J1-15	ELEC SYS	C4
E6	GEN 2	J1-12	GROUND				
	RECT 2	J1-16	GROUND	J1-13	J1-16	ELEC SYS FAIL	C4
F6	OIL BYP ENG 2	J1-18	GROUND	J1-88	J1-18	ENG 2	F3
A7	FUEL BYP ENG 1	J1-23	GROUND	J1-91	J1-23	ENG 1	A3
B7	HOT RECT 1	J1-42	GROUND				
C7	CHIPS MAIN XMSN	J1-3	GROUND	J1-80	J1-3	CHIPS MAIN XMSN	C3
D7	TEMP INT	J1-26	GROUND	J1-33	J1-26	TEMP INT	
	TEMP TR	J1-25	GROUND	J1-64	J1-25	TEMP TR	
E7	HOT RECT 2	J1-43	GROUND				
F7	FUEL BYP ENG 2	J1-24	GROUND	J1-92	J1-24	ENG 2	F3
A8	FUEL PSI ENG 1	J1-78	GROUND	J1-5	J1-78	ENG 1	A3

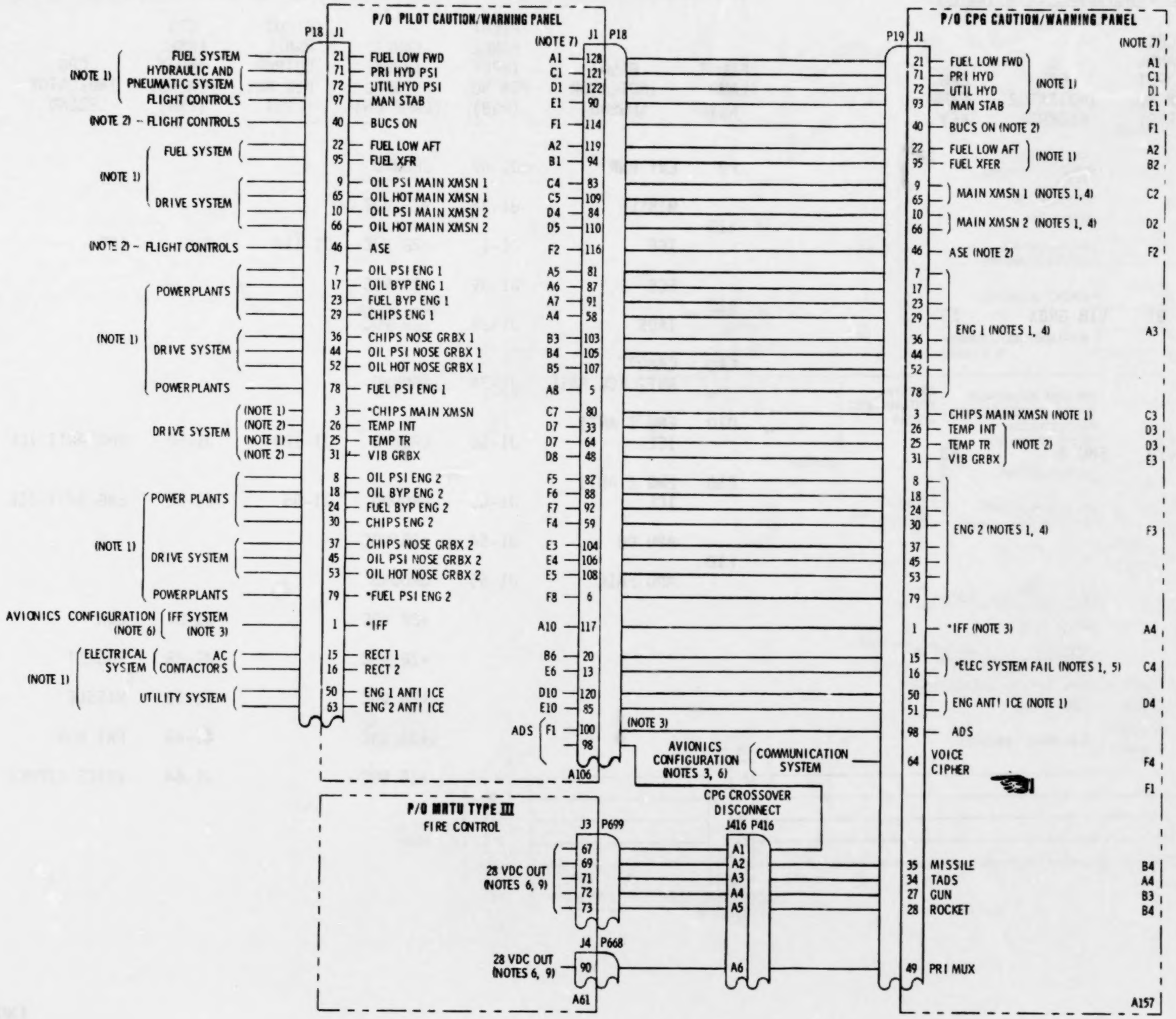
GO TO NEXT PAGE

9-30-1. PILOT AND CPG CAUTION/WARNING PANELS - INDICATORS FUNCTIONAL DATA (cont)

PILOT LAMP KEY	PILOT INDICATOR LEGEND	PILOT PANEL INPUT PIN NO. (P18)	FAULT INPUT SIGNAL (LAMP ON)	PILOT PANEL OUTPUT PIN NO. (P18)	CPG PANEL INPUT PIN NO. (P19)	CPG INDICATOR LEGEND	CPG LAMP KEY
B8	PRI MUX	J1-49	+28 VDC				
	RDR JAM	J1-101	GROUND				
C8	SHAFT DRIVEN COMP	J1-38	GROUND				
D8	VIB GRBX	J1-31	GROUND	J1-48	J1-31	VIB GRBX	E3
E8	HOT BAT	J1-57	GROUND				
	CHARGER	J1-56	GROUND				
F8	FUEL PSI ENG 2	J1-79	GROUND	J1-6	J1-79	ENG 2	F3
A9	GUN	J1-27	+28 VDC				
	ROCKET	J1-28	+28 VDC				
B9	IR JAM	J1-99	GROUND				
	PNVS	J1-77	+28 VDC				
C9	BLADE ANTI ICE FAIL	J1-75	GROUND				
D9	ENG ICE	J1-73	+28 VDC				
E9	RTR BK	J1-2	+28 VDC				
F9	CANOPY	J1-32	GROUND				
F9	EXT PWR	J1-47	GROUND				
A10	MISSLE	J1-35	+28 VDC				
	IFF	J1-1	+28 VDC	J1-117	J1-1	IFF	A4
B10	ECS	J1-39	+28 VDC				
	TADS	J1-34	+28 VDC				
C10	CANOPY ANTI ICE FAIL	J1-74	GROUND				
D10	ENG 1 ANTI ICE	J1-50	GROUND	J1-120-	J1-50	ENG ANTI ICE	D4
E10	ENG 2 ANTI ICE	J1-63	GROUND	J1-85	J1-51	ENG ANTI ICE	D4
F10	APU ON	J1-54	+28 VDC				
	APU FAIL	J1-55	GROUND				
			+28 VDC		J1-27	GUN	B3
			+28 VDC		J1-28	ROCKET	
			+28 VDC		J1-35	MISSLE	B4
			+28 VDC		J1-49	PRI MUX	
			+28 VDC		J1-64	VOICE CIPHER	F4

END OF TASK

9-30-2. PILOT AND CPG CAUTION/WARNING PANELS - INTERCONNECTION DIAGRAM


P/O PILOT CAUTION/WARNING PANEL
P18 J1
(NOTE 7) J1 P18
(NOTE 1)
FUEL SYSTEM 21 FUEL LOW FWD A1 128
HYDRAULIC AND PNEUMATIC SYSTEM 71 PRI HYD PSI C1 121
72 UTIL HYD PSI D1 122
FLIGHT CONTROLS 97 MAN STAB E1 90
(NOTE 2) - FLIGHT CONTROLS 40 BUCS ON F1 114
(NOTE 1)
FUEL SYSTEM 22 FUEL LOW AFT A2 119
95 FUEL XFR B1 94
DRIVE SYSTEM 9 OIL PSI MAIN XMSN 1 C4 83
65 OIL HOT MAIN XMSN 1 C5 109
10 OIL PSI MAIN XMSN 2 D4 84
66 OIL HOT MAIN XMSN 2 D5 110
(NOTE 2) - FLIGHT CONTROLS 46 ASE F2 116
(NOTE 1)
POWERPLANTS 7 OIL PSI ENG 1 A5 81
17 OIL BYP ENG 1 A6 87
23 FUEL BYP ENG 1 A7 91
29 CHIPS ENG 1 A4 58
DRIVE SYSTEM 36 CHIPS NOSE GRBX 1 B3 103
44 OIL PSI NOSE GRBX 1 B4 105
52 OIL HOT NOSE GRBX 1 B5 107
POWERPLANTS 78 FUEL PSI ENG 1 A8 5
DRIVE SYSTEM
(NOTE 1) 3 *CHIPS MAIN XMSN C7 80
(NOTE 2) 26 TEMP INT D7 33
(NOTE 1) 25 TEMP TR D7 64
(NOTE 2) 31 VIB GRBX D8 48
(NOTE 1)
POWER PLANTS 8 OIL PSI ENG 2 F5 82
18 OIL BYP ENG 2 F6 88
24 FUEL BYP ENG 2 F7 92
30 CHIPS ENG 2 F4 59
DRIVE SYSTEM 37 CHIPS NOSE GRBX 2 E3 104
45 OIL PSI NOSE GRBX 2 E4 106
53 OIL HOT NOSE GRBX 2 E5 108
POWERPLANTS 79 *FUEL PSI ENG 2 F8 6
AVIONICS CONFIGURATION (NOTE 6) IFF SYSTEM (NOTE 3) 1 *IFF A10 117
(NOTE 1)
ELECTRICAL SYSTEM AC CONTACTORS 15 RECT 1 B6 20
16 RECT 2 E6 13
UTILITY SYSTEM 50 ENG 1 ANTI ICE D10 120
63 ENG 2 ANTI ICE E10 85
ADS F1 100
98
(NOTE 3)
A106
AVIONICS CONFIGURATION (NOTES 3, 6)
COMMUNICATION SYSTEM
P/O CPG CAUTION/WARNING PANEL
P19 J1
(NOTE 7)
21 FUEL LOW FWD A1
71 PRI HYD C1
72 UTIL HYD D1
93 MAN STAB E1
(NOTE 1)
40 BUCS ON (NOTE 2) F1
22 FUEL LOW AFT A2
95 FUEL XFER B2
(NOTE 1)
9 65 MAIN XMSN 1 (NOTES 1, 4) C2
10 66 MAIN XMSN 2 (NOTES 1, 4) D2
46 ASE (NOTE 2) F2
7 17 23 29 36 44 52 78 ENG 1 (NOTES 1, 4) A3
3 CHIPS MAIN XMSN (NOTE 1) C3
26 TEMP INT D3
25 TEMP TR D3
31 VIB GRBX E3
(NOTE 2)
8 18 24 30 37 45 53 79 ENG 2 (NOTES 1, 4) F3
1 *IFF (NOTE 3) A4
15 16 *ELEC SYSTEM FAIL (NOTES 1, 5) C4
50 51 ENG ANTI ICE (NOTE 1) D4
98 ADS
64 VOICE F4
CIPHER F1
P/O MRTU TYPE III
FIRE CONTROL
J3 P699
28 VDC OUT (NOTES 6, 9) 67 69 71 72 73
CPG CROSSOVER DISCONNECT
J416 P416
A1 A2 A3 A4 A5
35 MISSILE B4
34 TADS A4
27 GUN B3
28 ROCKET B4
J4 P668
28 VDC OUT (NOTES 6, 9) 90
A6
49 PRI MUX
A61
A157

NOTES:

1. MECHANICAL SWITCH CLOSURE FAULT INPUT SIGNAL:

   LIGHT OFF - 5 - 30 VDC
   LIGHT ON - 0.1 VDC (GROUND)

2. SOLID STATE SWITCH CLOSURE INPUT SIGNAL:

   LIGHT OFF - 5 - 30 VDC
   LIGHT ON - 0.5 VDC (GROUND)

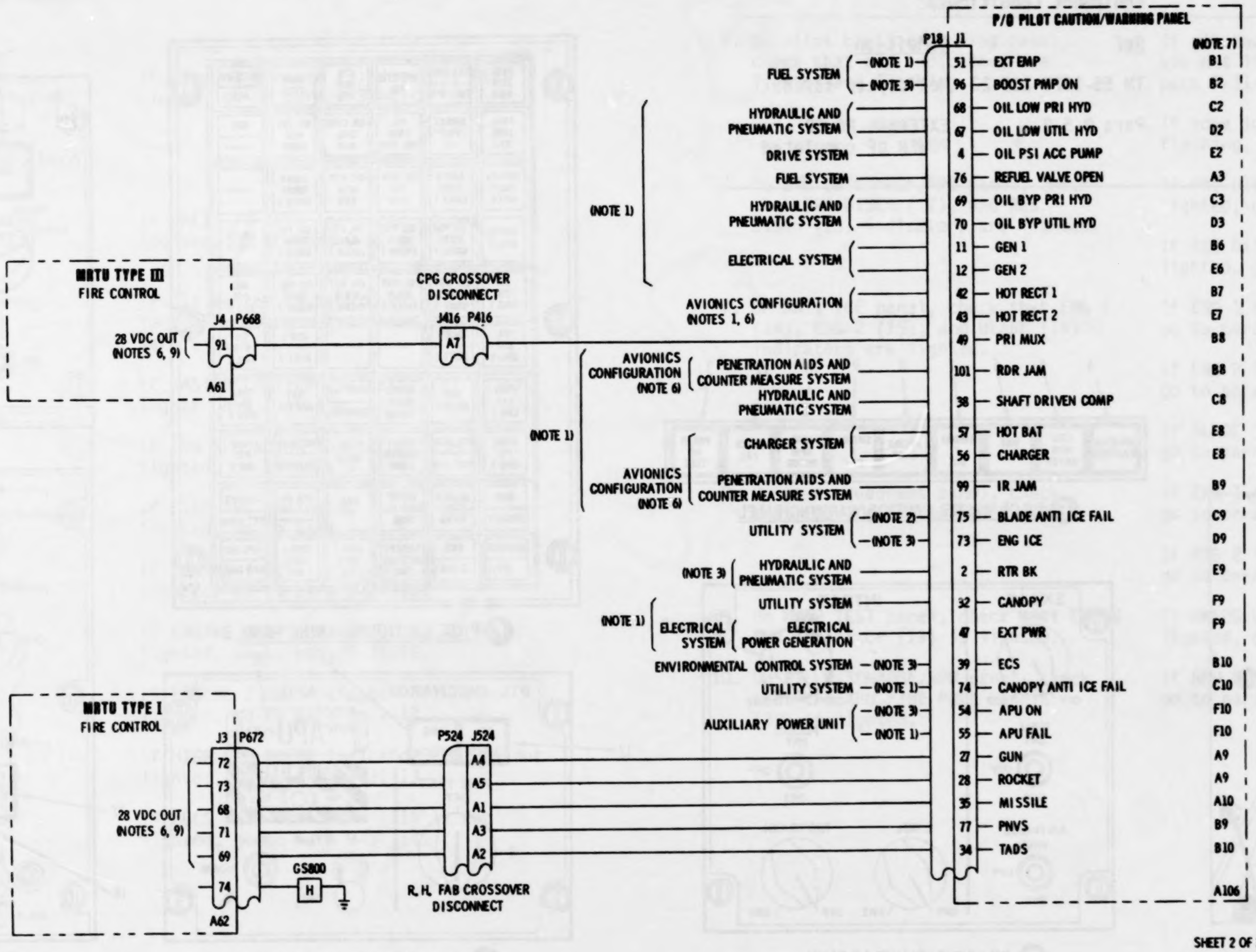
3. 28 VDC INPUT SIGNAL:

   LIGHT OFF - 0 - 0.5 VDC (GROUND)
   LIGHT ON - 16 - 30 VDC

4. ONE OR MORE FAULT INPUTS TURNS ON LIGHT.
5. BOTH FAULT INPUTS MUST BE PRESENT TO TURN ON LIGHT.
6. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.
7. ITEMS IN THIS COLUMN INDICATE LIGHT POSITIONS SHOWN IN PILOT AND CPG CAUTION/WARNING PANEL FUNCTIONAL DATA.
8. ALL LIGHTS ARE YELLOW (CAUTION), EXCEPT THOSE WITH AN ASTERISK AN ASTERISK (*) WHICH ARE RED (WARNING) LIGHTS.
9. AT FAILURE

SHEET 1 OF 2 MM04/1-784-1F

9-30-2. PILOT AND CPG CAUTION/WARNING PANELS - INTERCONNECTION DIAGRAM (cont)


P/O PILOT CAUTION/WARNING PANEL
P18
J1
(NOTE 7)
FUEL SYSTEM
(NOTE 1)
(NOTE 3)
51 EXT EMP B1
96 BOOST PMP ON B2
HYDRAULIC AND PNEUMATIC SYSTEM
68 OIL LOW PRI HYD C2
67 OIL LOW UTIL HYD D2
DRIVE SYSTEM
4 OIL PSI ACC PUMP E2
FUEL SYSTEM
76 REFUEL VALVE OPEN A3
HYDRAULIC AND PNEUMATIC SYSTEM
69 OIL BYP PRI HYD C3
70 OIL BYP UTIL HYD D3
(NOTE 1)
ELECTRICAL SYSTEM
11 GEN 1 B6
12 GEN 2 E6
AVIONICS CONFIGURATION (NOTES 1, 6)
42 HOT RECT 1 B7
43 HOT RECT 2 E7
49 PRI MUX B8
MRTU TYPE III
FIRE CONTROL
J4
P668
28 VDC OUT (NOTES 6, 9)
91
A61
CPG CROSSOVER DISCONNECT
J416
P416
A7
(NOTE 1)
AVIONICS CONFIGURATION (NOTE 6)
PENETRATION AIDS AND COUNTER MEASURE SYSTEM
101 RDR JAM B8
HYDRAULIC AND PNEUMATIC SYSTEM
38 SHAFT DRIVEN COMP C8
CHARGER SYSTEM
57 HOT BAT E8
56 CHARGER E8
AVIONICS CONFIGURATION (NOTE 6)
PENETRATION AIDS AND COUNTER MEASURE SYSTEM
99 IR JAM B9
UTILITY SYSTEM
(NOTE 2)
(NOTE 3)
75 BLADE ANTI ICE FAIL C9
73 ENG ICE D9
(NOTE 3)
HYDRAULIC AND PNEUMATIC SYSTEM
2 RTR BK E9
(NOTE 1)
UTILITY SYSTEM
32 CANOPY F9
ELECTRICAL SYSTEM
ELECTRICAL POWER GENERATION
47 EXT PWR F9
ENVIRONMENTAL CONTROL SYSTEM
(NOTE 3)
39 ECS B10
UTILITY SYSTEM
(NOTE 1)
74 CANOPY ANTI ICE FAIL C10
AUXILIARY POWER UNIT
(NOTE 3)
(NOTE 1)
54 APU ON F10
55 APU FAIL F10
MRTU TYPE I
FIRE CONTROL
J3
P672
28 VDC OUT (NOTES 6, 9)
72
73
68
71
69
74
A62
GS800
H
P524
J524
A4
A5
A1
A3
A2
R. H. FAB CROSSOVER DISCONNECT
27 GUN A9
28 ROCKET A9
35 MISSILE A10
77 PNVS B9
34 TADS B10
A106

SHEET 2 OF 2 MM04/1-784-2A

9-31-1. PILOT CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK

Personnel Required:

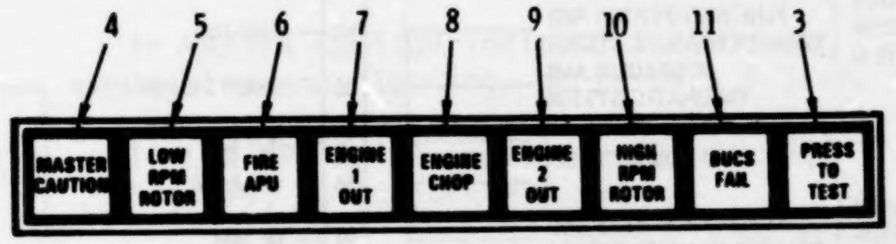
68F10 Aircraft Electrician

References:

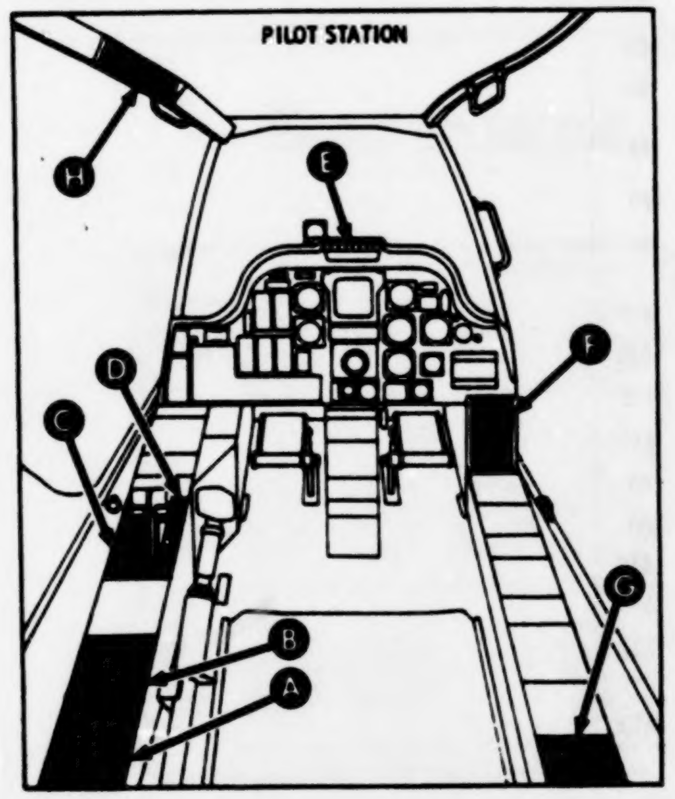
TM 55-1520-238-23

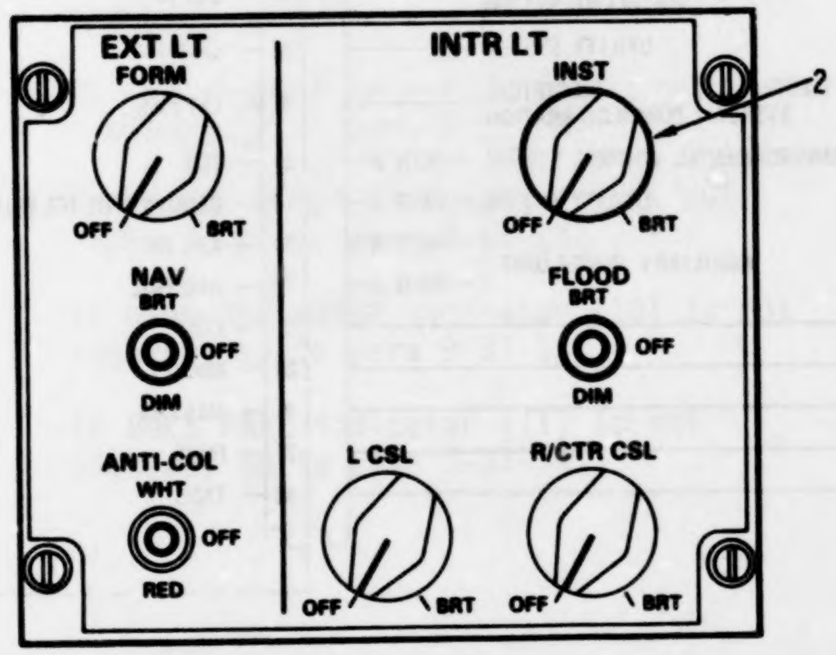
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

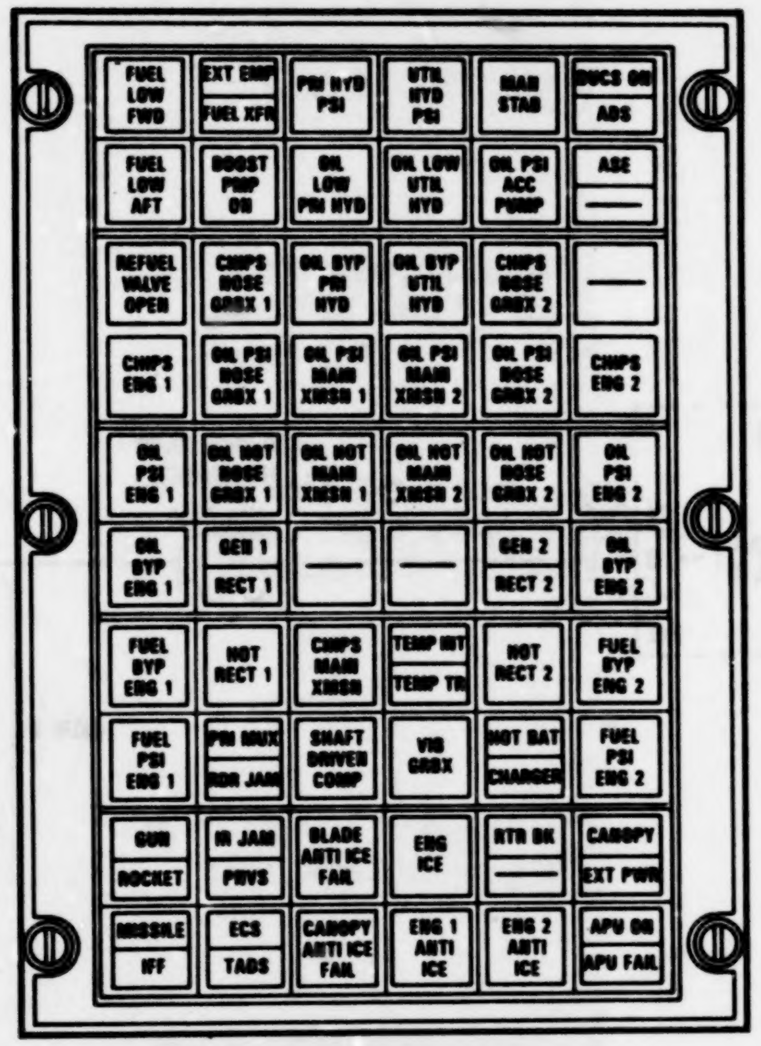

4
5
6
7
8
9
10
11
3
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

E PILOT MASTER CAUTION/WARNING PANEL

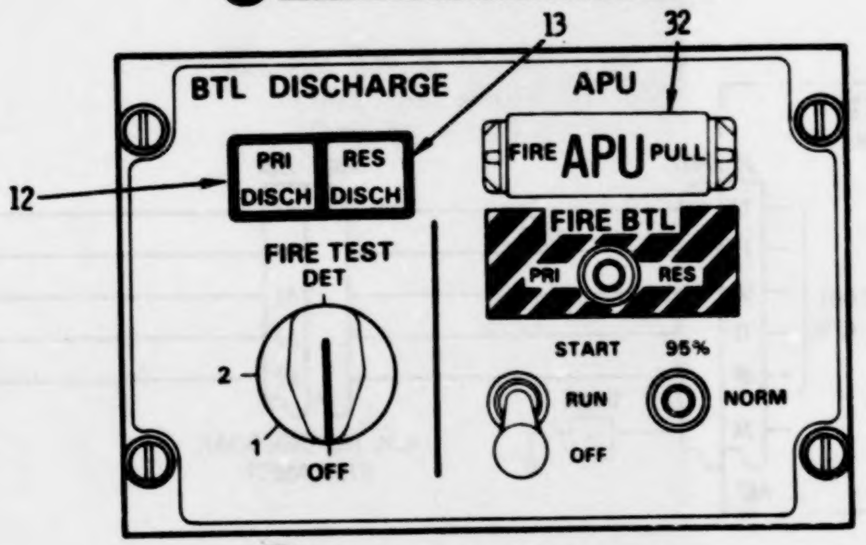

PILOT STATION
H
E
F
D
C
B
A
G


EXT LT
FORM
OFF
BRT
NAV
BRT
OFF
DIM
ANTI-COL
WHT
OFF
RED
INTR LT
INST
OFF
BRT
2
FLOOD
BRT
OFF
DIM
L CSL
OFF
BRT
R/CTR CSL
OFF
BRT

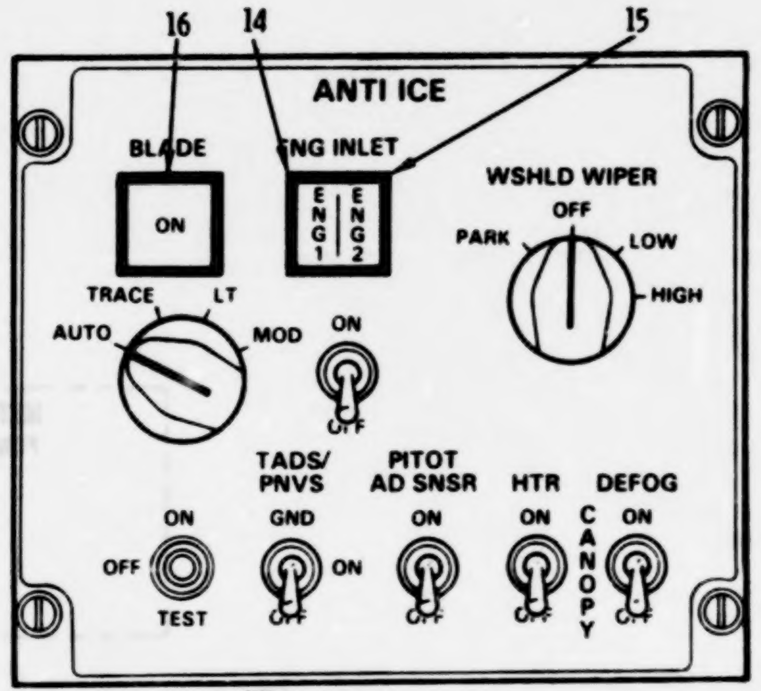
B PILOT EXT LT/ INTR LT PANEL


FUEL LOW FWD
EXT EMP
FUEL XFR
PRI HYD PSI
UTIL HYD PSI
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
BOOST PMP ON
OIL LOW PRI HYD
OIL LOW UTIL HYD
OIL PSI ACC PUMP
ASE
REFUEL VALVE OPEN
CHIPS NOSE GRBX 1
OIL BYP PRI HYD
OIL BYP UTIL HYD
CHIPS NOSE GRBX 2
CHIPS ENG 1
OIL PSI NOSE GRBX 1
OIL PSI MAIN XMSN 1
OIL PSI MAIN XMSN 2
OIL PSI NOSE GRBX 2
CHIPS ENG 2
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

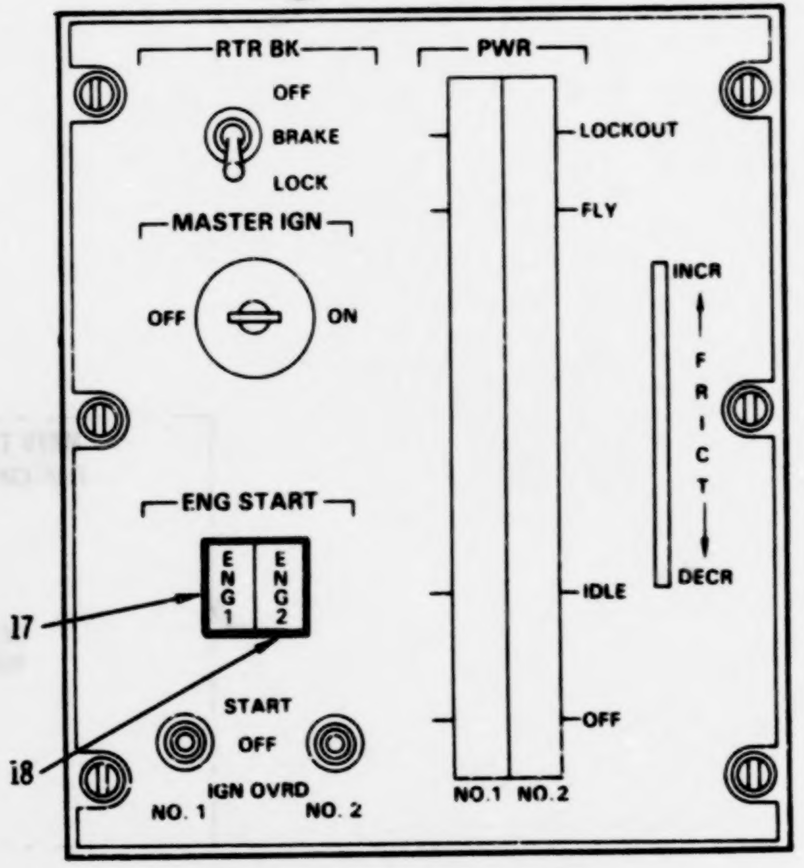
F PILOT CAUTION/WARNING PANEL


13
32
BTL DISCHARGE
APU
12
PRI DISCH
RES DISCH
FIRE APU PULL
FIRE BTL
PRI
RES
FIRE TEST DET
2
1
OFF
START
RUN
OFF
95%
NORM

G BTL DISCHARGE /APU PANEL


16
14
15
ANTI ICE
BLADE
ON
ENG INLET
ENG 1
ENG 2
WSHLD WIPER
OFF
PARK
LOW
HIGH
TRACE
LT
AUTO
MOD
ON
OFF
TADS/ PNVS
GND
ON
OFF
PITOT AD SNSR
ON
OFF
HTR
ON
OFF
CANOPY
DEFOG
ON
OFF
ON
OFF
TEST

A ANTI-ICE PANEL


RTR BK
OFF
BRAKE
LOCK
MASTER IGN
OFF
ON
ENG START
ENG 1
ENG 2
17
18
START
OFF
IGN OVRD
NO. 1
NO. 2
PWR
LOCKOUT
FLY
IDLE
OFF
NO.1
NO.2
INCR
FRICT
DECR

C POWER QUADRANT PANEL

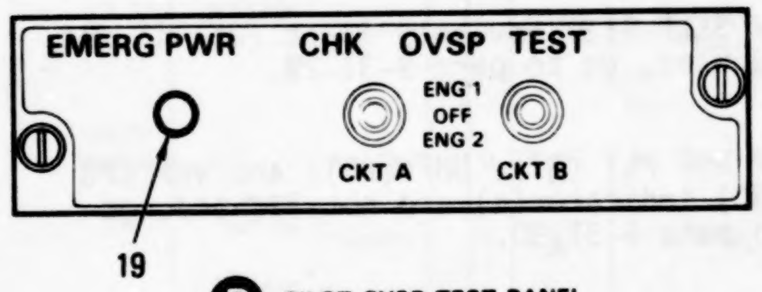
MM04/1-1029-1B

GO TO NEXT PAGE

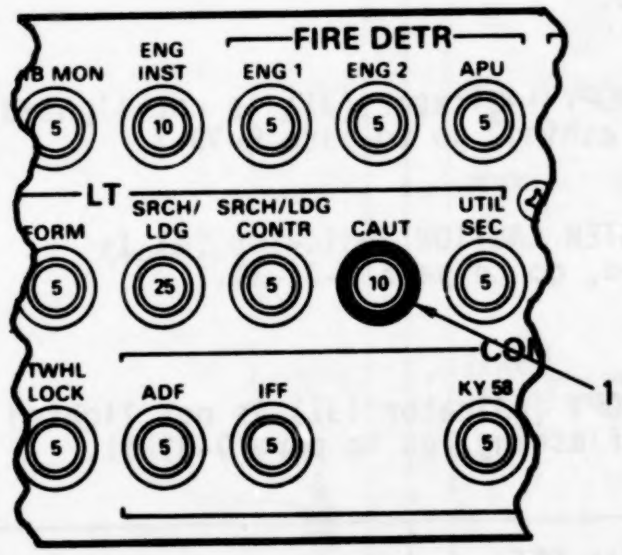
9-31-1. PILOT CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On pilot circuit breaker panel, check that **LT CAUT** circuit breaker (1) is closed.	If circuit breaker (1) does not stay closed, go to para 9-31-4.
2. On pilot **EXT LT/INTR LT** panel, turn **INST** control (2) to **BRT**.	
3. On pilot master caution/warning panel, check that **PRESS TO TEST** indicator (3) is lighted.	If **PRESS TO TEST** indicator is not lighted, go to para 9-31-5.
4. On pilot master caution/warning panel, depress **PRESS TO TEST** indicator (3).	If all master caution/warning indicators, are not lighted, go to para 9-31-6. If **MASTER CAUTION** indicator (4) is not lighted and flashing, go to para 9-31-7. If **LOW RPM ROTOR** indicator (5) is not lighted, go to para 9-31-8. If **FIRE APU** indicator (6) is not lighted, go to para 9-31-9. If **ENGINE 1 OUT** indicator (7) is not lighted, go to para 9-31-10. If **ENGINE CHOP** indicator (8) is not lighted, go to para 9-31-11. If **ENGINE 2 OUT** indicator (9) is not lighted, go to para 9-31-12. If **HIGH RPM ROTOR** indicator (10) is not lighted, go to para 9-31-13. If **BUCS FAIL** indicator (11) is not lighted, go to para 9-31-14.
5. On pilot caution/warning panel, check that all indicators are lighted and flashing.	If all caution/warning indicators are not lighted and flashing, go to para 9-31-6. If some indicators are not lighted and flashing, go to para 9-31-1.
6. On **BTL DISCHARGE/APU** panel, check that **PRI DISCH** (12), and **RES DISCH** (13) indicators are lighted.	If **PRI DISCH** indicator (12) is not lighted, go to para 9-31-15. If **RES DISCH** indicator (13) is not lighted, go to para 9-31-16.
7. On **ANTI ICE** panel, check that **ENG 1** (14), **ENG 2** (15), and **BLADE** (16) indicators are lighted.	If **ENG 1** indicator (14) is not lighted, go to para 9-31-17. If **ENG 2** indicator (15) is not lighted, go to para 9-31-18. If **BLADE** indicator (16) is not lighted, go to para 9-31-19.
8. On power quadrant panel, check that **ENG 1** (17) and **ENG 2** (18)	If **ENG 1** indicator (17) is not lighted, go to para 9-31-20. If **ENG 2** indicator (18) is not lighted, go to para 9-31-21.
9. On **OVSP TEST** panel, check that **EMERG PWR** indicator (19) is lighted.	If **EMERG PWR** indicator (19) is not lighted, go to para 9-31-22.
10. On **BTL DISCHARGE/APU** panel, check that the **APU FIRE PULL** handle (32) is lighted.	If **APU FIRE PULL** handle (32) does not light, go to para 9-31-32.



D PILOT OVSP TEST PANEL

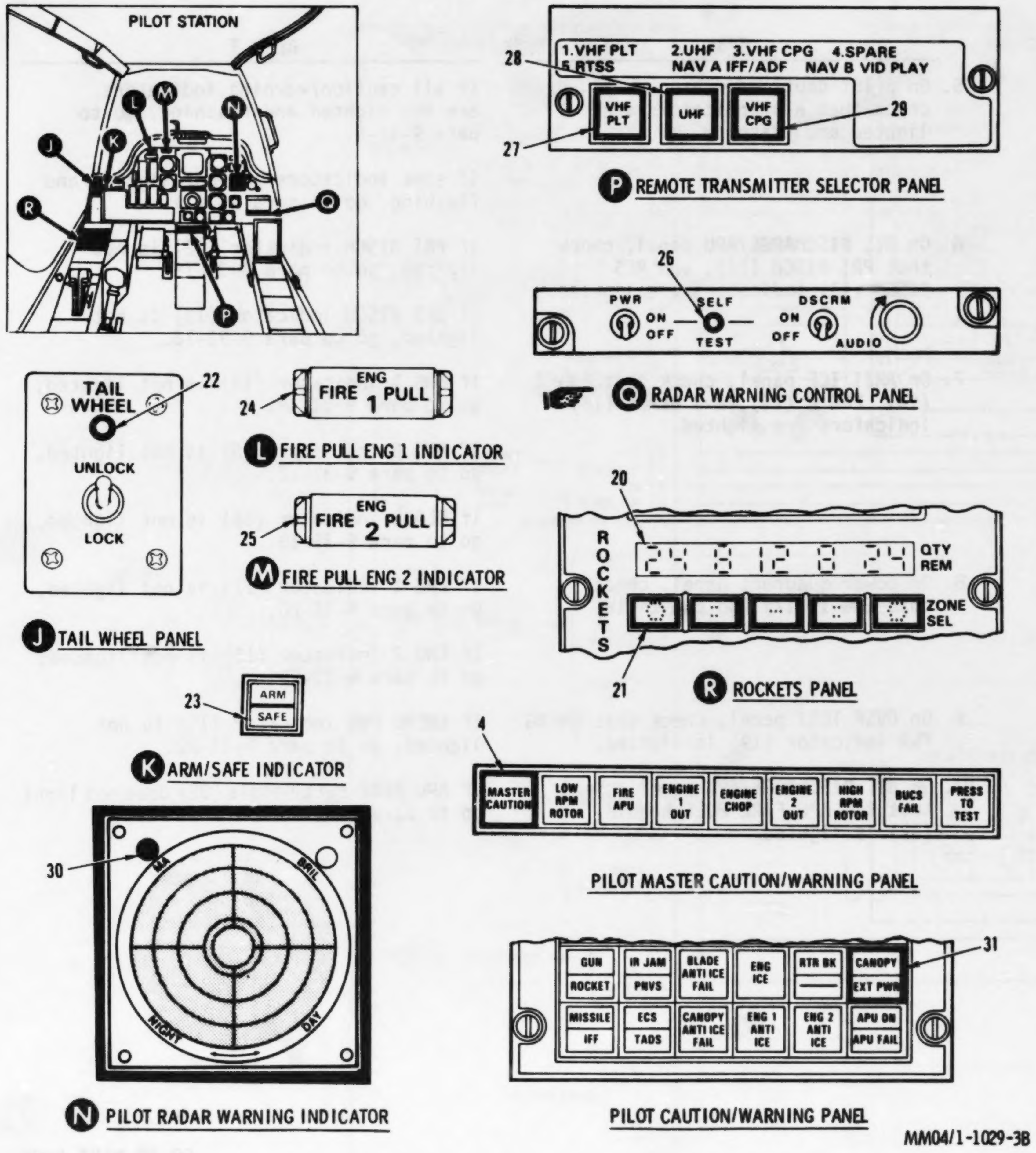


H PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1029-2A

GO TO NEXT PAGE

9-31-1. PILOT CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)


PILOT STATION
J
K
L
M
N
O
P
R
28
1.VHF PLT
5.RTSS
2.UHF
NAV A IFF/ADF
3.VHF CPG
NAV B VID PLAY
4.SPARE
VHF PLT
UHF
VHF CPG
29
27
P REMOTE TRANSMITTER SELECTOR PANEL
26
PWR
ON
OFF
SELF
TEST
DSCRM
ON
OFF
AUDIO
Q RADAR WARNING CONTROL PANEL
TAIL WHEEL
22
UNLOCK
LOCK
J TAIL WHEEL PANEL
24
FIRE ENG 1 PULL
L FIRE PULL ENG 1 INDICATOR
25
FIRE ENG 2 PULL
M FIRE PULL ENG 2 INDICATOR
20
ROCKETS
24 8 12 8 24
QTY REM
ZONE SEL
21
R ROCKETS PANEL
23
ARM
SAFE
K ARM/SAFE INDICATOR
4
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST
PILOT MASTER CAUTION/WARNING PANEL
30
MA
BRIL
NIGHT
DAY
N PILOT RADAR WARNING INDICATOR
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL
31
PILOT CAUTION/WARNING PANEL
MM04/1-1029-3B

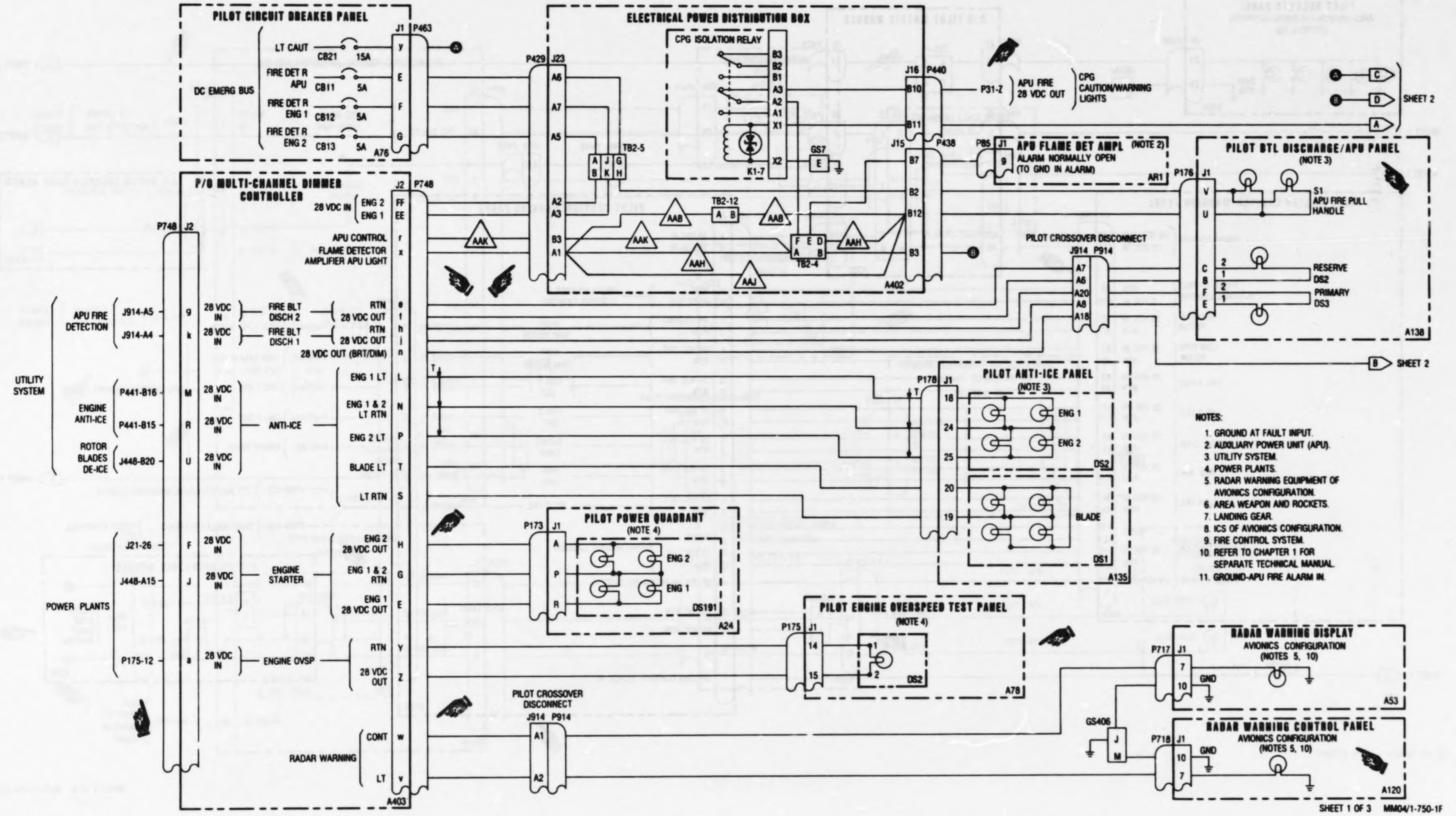
TASK	RESULT
11. On **ROCKETS** panel, check that **QTY REM** (20) and **ZONE SEL** (21) indicators are lighted.	If **QTY REM** (20) and **ZONE SEL** (21) indicators are not lighted, go to para 9-31-23.
12. On **TAILWHEEL** panel, check that **TAILWHEEL UNLOCK** indicator (22) is lighted.	If **TAILWHEEL UNLOCK** indicator (22) is not lighted, go to para 9-31-24.
13. On pilot instrument panel, check that **ARM/SAFE** (23), **FIRE PULL APU 1** (24) and **FIRE PULL APU 2** (25) indicators are lighted.	If **ARM/SAFE** indicator (23) is not lighted, go to para 9-31-25. If **FIRE PULL ENG 1** indicator (24) is not lighted, go to para 9-31-26. If **FIRE PULL ENG 2** indicator (25) is not lighted, go to para 9-31-27.
14. On pilot radar warning indicator, check that **MA** indicator (30) is lighted.	If **MA** indicator (30) is not lighted, go to para 9-31-28.
15. On radar warning control panel, check that **SELF TEST** advisory light (26) is lighted.	If **SELF TEST** advisory light (26) is not lighted, go to para 9-31-29.
16. On remote transmitter selector panel, check that **VHF PLT** (27), **UHF** (28), and **VHF CPG** (29) indicators are lighted.	If **VHF PLT** (27), **UHF** (28), and **VHF CPG** (30) indicator(s) are not lighted, go to para 9-31-30.
17. Open pilot canopy. On pilot master caution/warning panel, check that **MASTER caution** indicator (4) is lighted and flashing.	If **MASTER CAUTION** indicator (4) is not lighted and flashing, go to para 9-31-6.
18. On pilot caution/warning panel, check that **CANOPY** indicator (31) is lighted and flashing.	If **CANOPY** indicator (31) is not lighted and flashing, go to para 9-30-1.
19. On pilot master caution/warning panel, depress **MASTER CAUTION** indicator (4). Check that **MASTER CAUTION** indicator (4) is not lighted.	If **MASTER CAUTION** indicator (4) is lighted, go to para 9-31-31.
20. On pilot caution/warning panel, check that **CANOPY** indicator (31) is lighted and not flashing.	If **CANOPY** indicator (31) is not lighted or is flashing, go to para 9-31-31.

B. On pilot **EXT LT/INTR LT** panel set **INST** switch to **OFF**.

C. Perform EXTERNAL POWER - POWER DOWN procedure (para 9-5-3).

END OF TASK

9-31-2. PILOT CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM

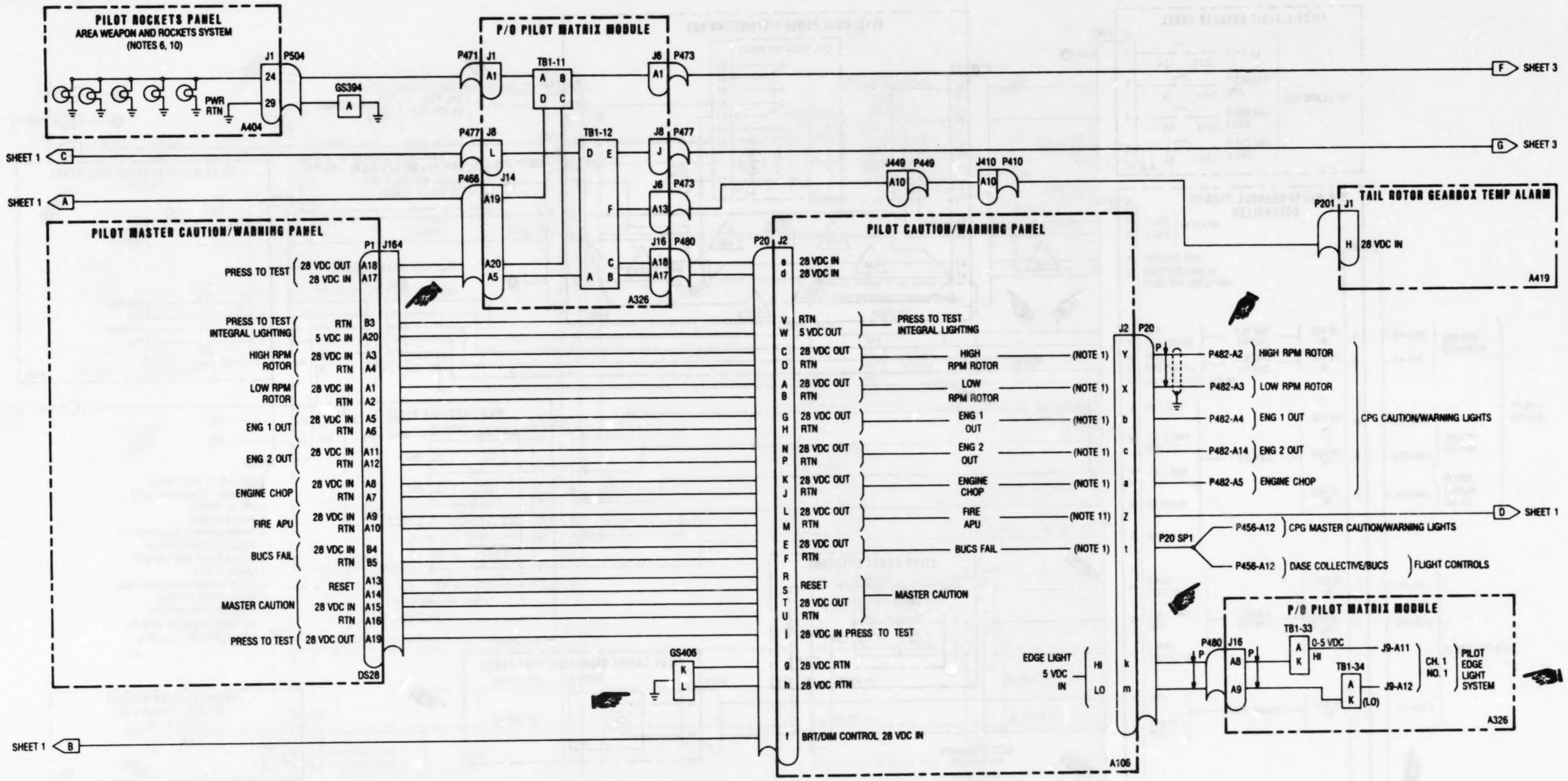

PILOT CIRCUIT BREAKER PANEL
DC EMERG BUS
LT CAUT CB21 15A
FIRE DET R APU CB11 5A
FIRE DET R ENG 1 CB12 5A
FIRE DET R ENG 2 CB13 5A
J1 P463
A76
P/O MULTI-CHANNEL DIMMER CONTROLLER
J2 P748
28 VDC IN ENG 2 ENG 1
APU CONTROL
FLAME DETECTOR AMPLIFIER APU LIGHT
FIRE BLT DISCH 2
FIRE BLT DISCH 1
RTN
28 VDC OUT
28 VDC OUT (BRT/DIM)
28 VDC IN
ANTI-ICE
ENG 1 LT
ENG 1 & 2 LT RTN
ENG 2 LT
BLADE LT
LT RTN
ENGINE STARTER
ENG 2 28 VDC OUT
ENG 1 & 2 RTN
ENG 1 28 VDC OUT
ENGINE OVSP
RADAR WARNING
CONT
LT
A403
UTILITY SYSTEM
APU FIRE DETECTION
J914-A5
J914-A4
ENGINE ANTI-ICE
P441-B16
P441-B15
ROTOR BLADES DE-ICE
J448-B20
POWER PLANTS
J21-26
J448-A15
P175-12
ELECTRICAL POWER DISTRIBUTION BOX
CPG ISOLATION RELAY
K1-7
P429 J23
TB2-5
TB2-12
TB2-4
GS7
AAK
AAB
AAH
AAJ
A402
J16 P440
J15 P438
P31-Z
APU FIRE 28 VDC OUT
CPG CAUTION/WARNING LIGHTS
SHEET 2
P85 J1
APU FLAME DET AMPL (NOTE 2)
ALARM NORMALLY OPEN (TO GND IN ALARM)
AR1
PILOT BTL DISCHARGE/APU PANEL (NOTE 3)
P176 J1
S1 APU FIRE PULL HANDLE
RESERVE DS2
PRIMARY DS3
A138
PILOT CROSSOVER DISCONNECT
J914 P914
PILOT ANTI-ICE PANEL (NOTE 3)
P178 J1
ENG 1
ENG 2
DS2
BLADE
DS1
A135
PILOT POWER QUADRANT (NOTE 4)
P173 J1
ENG 2
ENG 1
DS191
A24
PILOT ENGINE OVERSPEED TEST PANEL (NOTE 4)
P175 J1
DS2
A78
RADAR WARNING DISPLAY
AVIONICS CONFIGURATION (NOTES 5, 10)
P717 J1
GND
A53
GS406
RADAR WARNING CONTROL PANEL
AVIONICS CONFIGURATION (NOTES 5, 10)
P718 J1
GND
A120

NOTES:

1. GROUND AT FAULT INPUT.
2. AUXILIARY POWER UNIT (APU).
3. UTILITY SYSTEM.
4. POWER PLANTS.
5. RADAR WARNING EQUIPMENT OF AVIONICS CONFIGURATION.
6. AREA WEAPON AND ROCKETS.
7. LANDING GEAR.
8. ICS OF AVIONICS CONFIGURATION.
9. FIRE CONTROL SYSTEM.
10. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.
11. GROUND-APU FIRE ALARM IN.

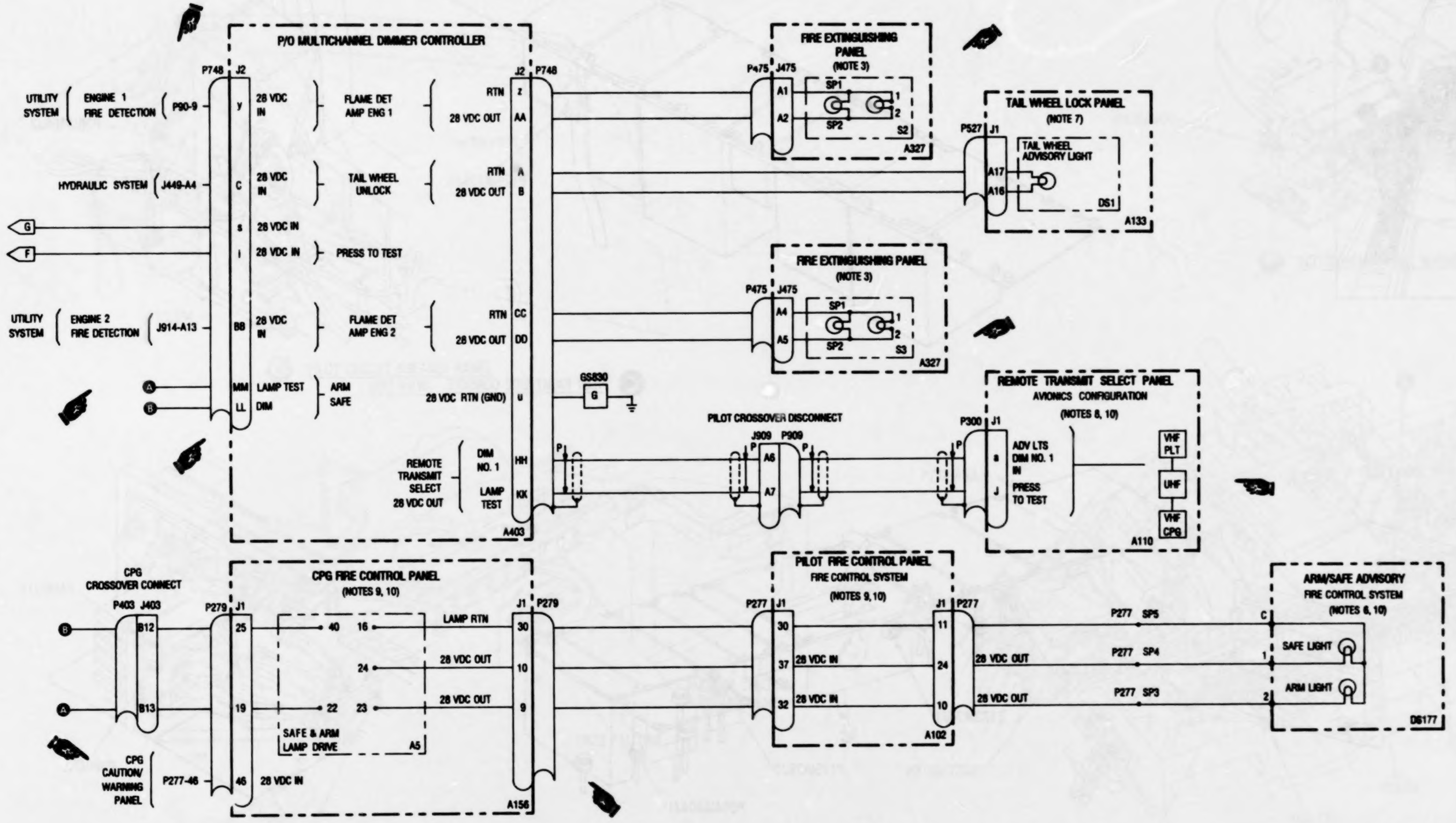
SHEET 1 OF 3 MM04/1-750-1F

9-31-2. PILOT CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)


PILOT ROCKETS PANEL
AREA WEAPON AND ROCKETS SYSTEM
(NOTES 6, 10)
J1
P504
24
29
PWR RTN
A404
GS394
A
P/O PILOT MATRIX MODULE
P471
J1
A1
TB1-11
A B
D C
J6
P473
A1
P477
J8
L
TB1-12
D E
F
C
A B
J8
P477
J
J6
P473
A13
J16
P480
A18
A17
P466
J14
A19
A20
A5
A326
SHEET 1 C
SHEET 1 A
SHEET 1 B
F SHEET 3
G SHEET 3
D SHEET 1
PILOT MASTER CAUTION/WARNING PANEL
P1
J164
PRESS TO TEST
28 VDC OUT A18
28 VDC IN A17
PRESS TO TEST INTEGRAL LIGHTING
RTN B3
5 VDC IN A20
HIGH RPM ROTOR
28 VDC IN A3
RTN A4
LOW RPM ROTOR
28 VDC IN A1
RTN A2
ENG 1 OUT
28 VDC IN A5
RTN A6
ENG 2 OUT
28 VDC IN A11
RTN A12
ENGINE CHOP
28 VDC IN A8
RTN A7
FIRE APU
28 VDC IN A9
RTN A10
BUCS FAIL
28 VDC IN B4
RTN B5
MASTER CAUTION
RESET A13
A14
28 VDC IN A15
RTN A16
PRESS TO TEST
28 VDC OUT A19
DS28
GS406
K
L
J449 P449
A10
J410 P410
A10
PILOT CAUTION/WARNING PANEL
P20
J2
e 28 VDC IN
d 28 VDC IN
V RTN
W 5 VDC OUT
PRESS TO TEST INTEGRAL LIGHTING
C 28 VDC OUT
D RTN
HIGH RPM ROTOR
A 28 VDC OUT
B RTN
LOW RPM ROTOR
G 28 VDC OUT
H RTN
ENG 1 OUT
N 28 VDC OUT
P RTN
ENG 2 OUT
K 28 VDC OUT
J RTN
ENGINE CHOP
L 28 VDC OUT
M RTN
FIRE APU
E 28 VDC OUT
F RTN
BUCS FAIL
R
S RESET
T 28 VDC OUT
U RTN
MASTER CAUTION
i 28 VDC IN PRESS TO TEST
g 28 VDC RTN
h 28 VDC RTN
f BRT/DIM CONTROL 28 VDC IN
(NOTE 1) Y
(NOTE 1) X
(NOTE 1) b
(NOTE 1) c
(NOTE 1) a
(NOTE 11) Z
(NOTE 1) t
EDGE LIGHT 5 VDC IN
HI k
LO m
A106
J2
P20
P
P482-A2 HIGH RPM ROTOR
P482-A3 LOW RPM ROTOR
P482-A4 ENG 1 OUT
P482-A14 ENG 2 OUT
P482-A5 ENGINE CHOP
CPG CAUTION/WARNING LIGHTS
P20 SP1
P456-A12 CPG MASTER CAUTION/WARNING LIGHTS
P456-A12 DASE COLLECTIVE/BUCS
FLIGHT CONTROLS
TAIL ROTOR GEARBOX TEMP ALARM
P201
J1
H 28 VDC IN
A419
P/O PILOT MATRIX MODULE
P480
J16
P
A8
A9
TB1-33
A
K
0-5 VDC
HI
TB1-34
A
K
(LO)
J9-A11
J9-A12
CH. 1 NO. 1
PILOT EDGE LIGHT SYSTEM
A326

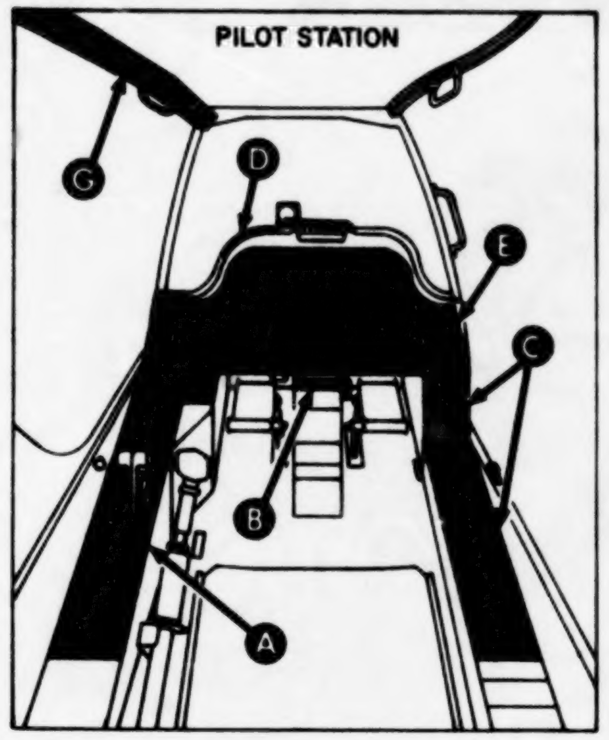
SHEET 2 OF 3 MM04/1-750-2D

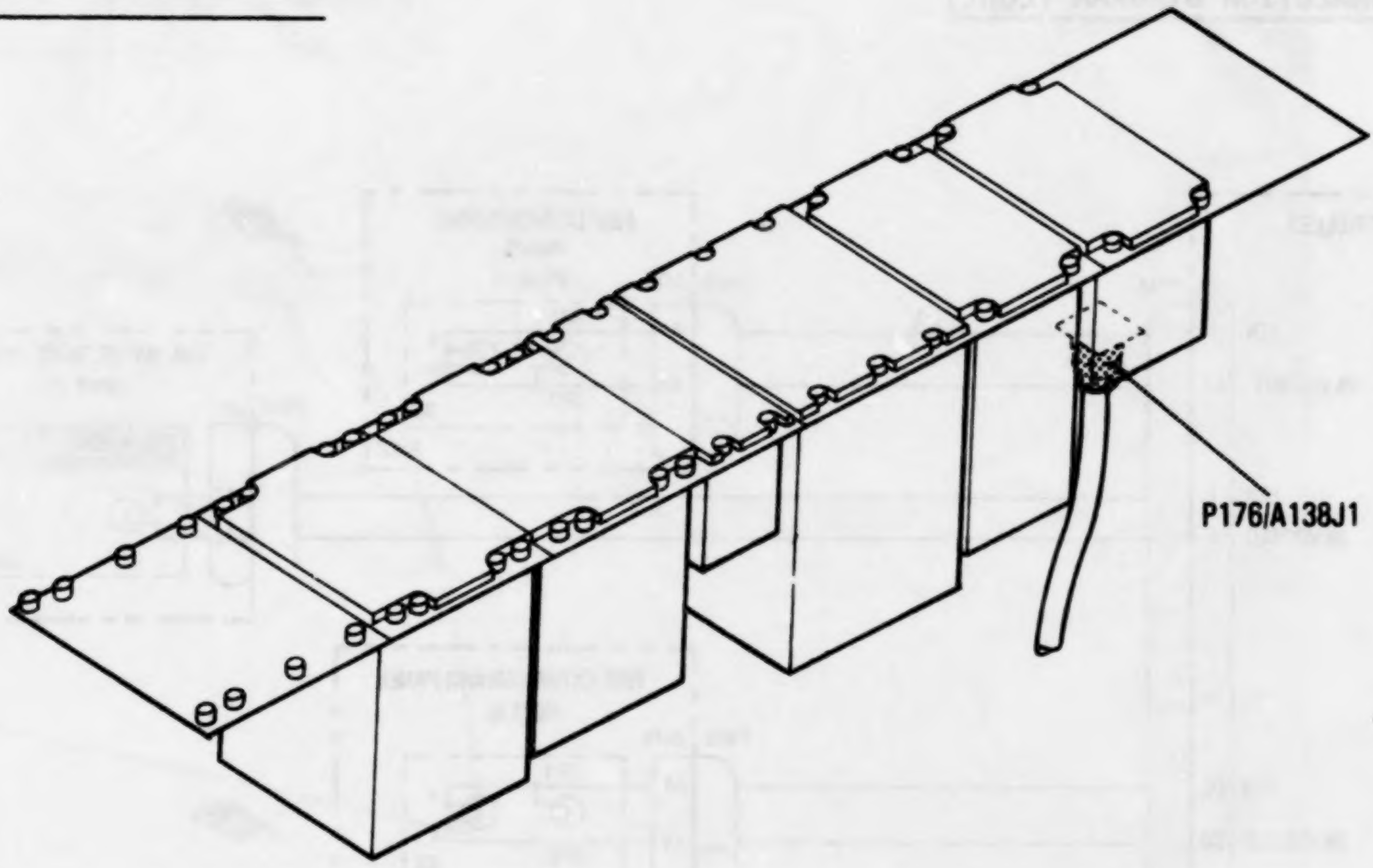
9-31-2. PILOT CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)

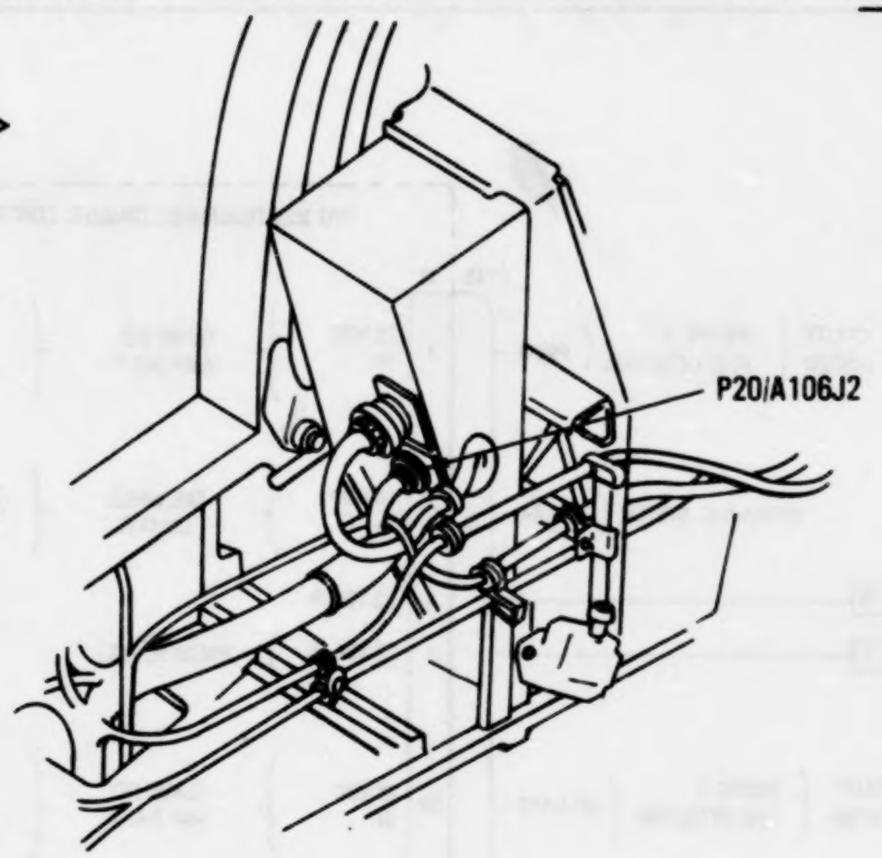

P/O MULTICHANNEL DIMMER CONTROLLER
P748
J2
UTILITY SYSTEM
ENGINE 1 FIRE DETECTION
P90-9
y
28 VDC IN
FLAME DET AMP ENG 1
RTN
z
28 VDC OUT
AA
HYDRAULIC SYSTEM
J449-A4
C
TAIL WHEEL UNLOCK
A
B
G
F
s
28 VDC IN
i
PRESS TO TEST
ENGINE 2 FIRE DETECTION
J914-A13
BB
FLAME DET AMP ENG 2
CC
DD
MM
LAMP TEST
LL
DIM
ARM
SAFE
GS830
28 VDC RTN (GND)
u
REMOTE TRANSMIT SELECT 28 VDC OUT
DIM NO. 1
HH
LAMP TEST
KK
A403
P
FIRE EXTINGUISHING PANEL
(NOTE 3)
P475
J475
A1
A2
SP1
SP2
1
2
S2
A327
TAIL WHEEL LOCK PANEL
(NOTE 7)
P527
J1
TAIL WHEEL ADVISORY LIGHT
A17
A16
DS1
A133
FIRE EXTINGUISHING PANEL
(NOTE 3)
A4
A5
S3
PILOT CROSSOVER DISCONNECT
J909
P909
A6
A7
REMOTE TRANSMIT SELECT PANEL
AVIONICS CONFIGURATION
(NOTES 8, 10)
P300
a
J
ADV LTS DIM NO. 1 IN
PRESS TO TEST
VHF PLT
UHF
VHF CPG
A110
CPG CROSSOVER CONNECT
P403
J403
B12
B13
CPG FIRE CONTROL PANEL
(NOTES 9, 10)
P279
25
19
46
40
16
24
22
23
LAMP RTN
28 VDC OUT
30
10
9
SAFE & ARM LAMP DRIVE
A5
CPG CAUTION/ WARNING PANEL
P277-46
28 VDC IN
A156
PILOT FIRE CONTROL PANEL
FIRE CONTROL SYSTEM
(NOTES 9, 10)
P277
37
32
11
28 VDC OUT
A102
SP5
SP4
SP3
ARM/SAFE ADVISORY
FIRE CONTROL SYSTEM
(NOTES 6, 10)
C
1
2
SAFE LIGHT
ARM LIGHT
DS177

SHEET 3 OF 3 MM04/1-750-3D

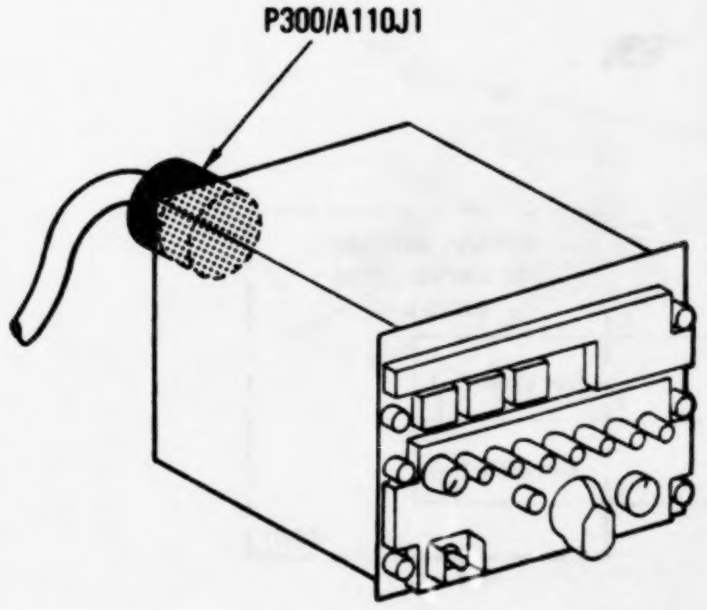
9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


PILOT STATION
G
D
E
C
B
A

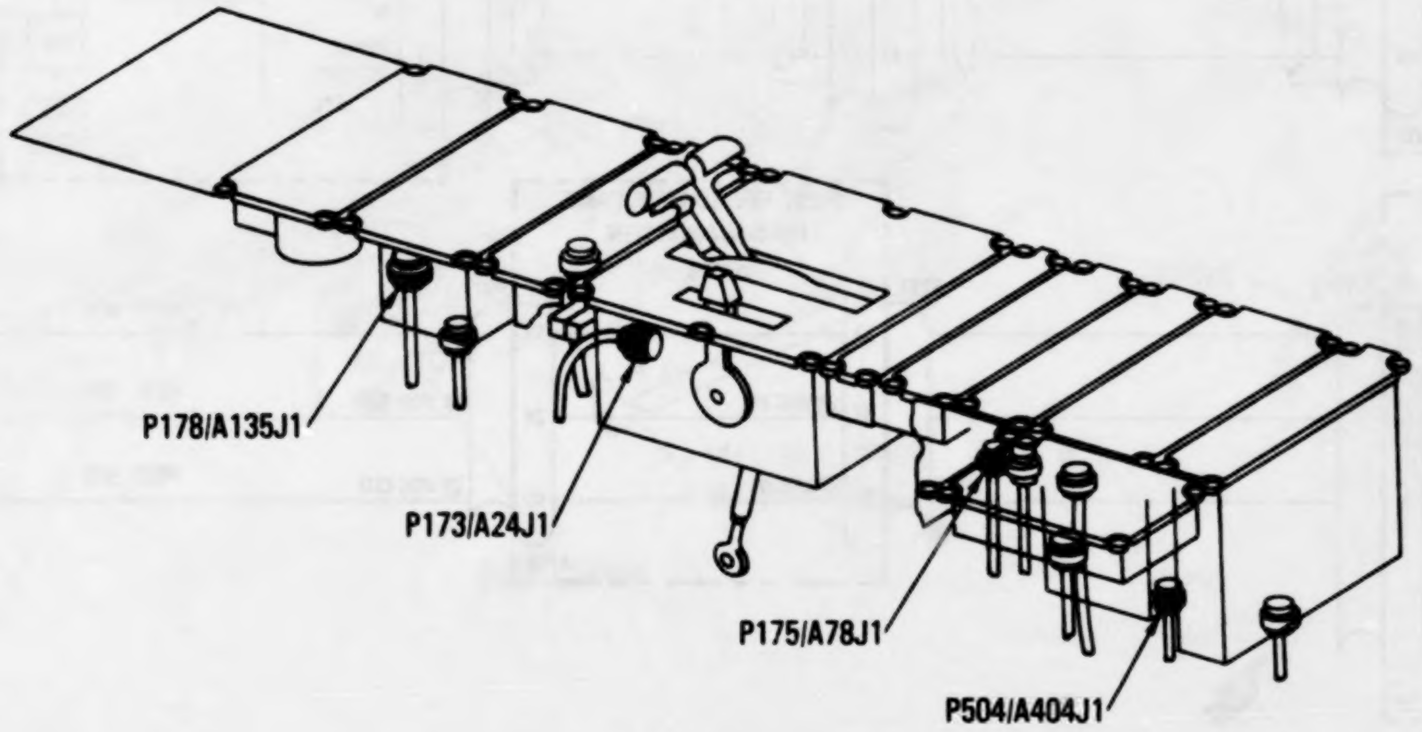

P176/A138J1



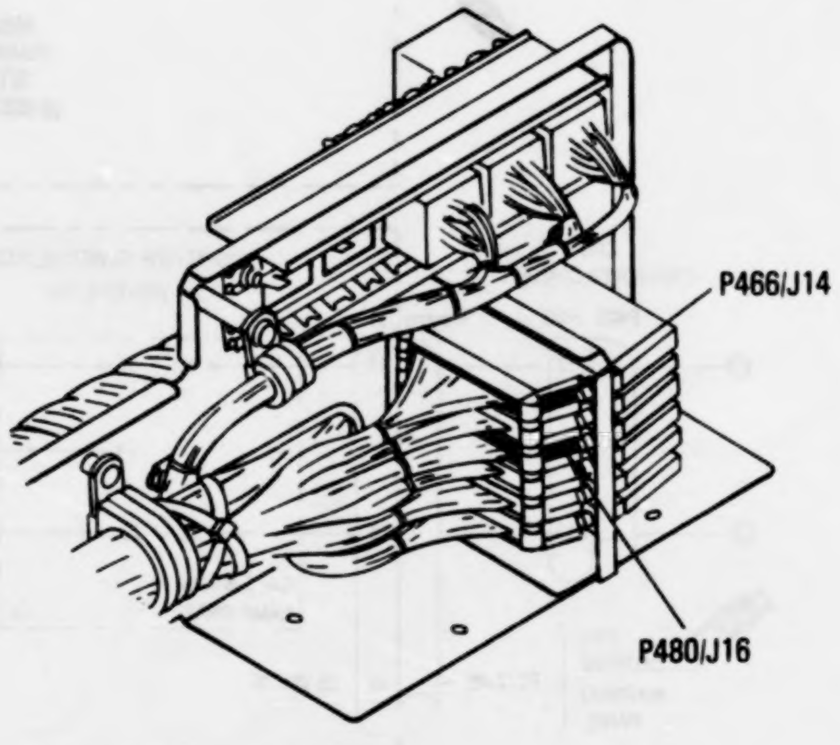
C PILOT RIGHT SIDE CONSOLE


P300/A110J1

B PILOT CENTER CONSOLE


P178/A135J1
P173/A24J1
P175/A78J1
P504/A404J1

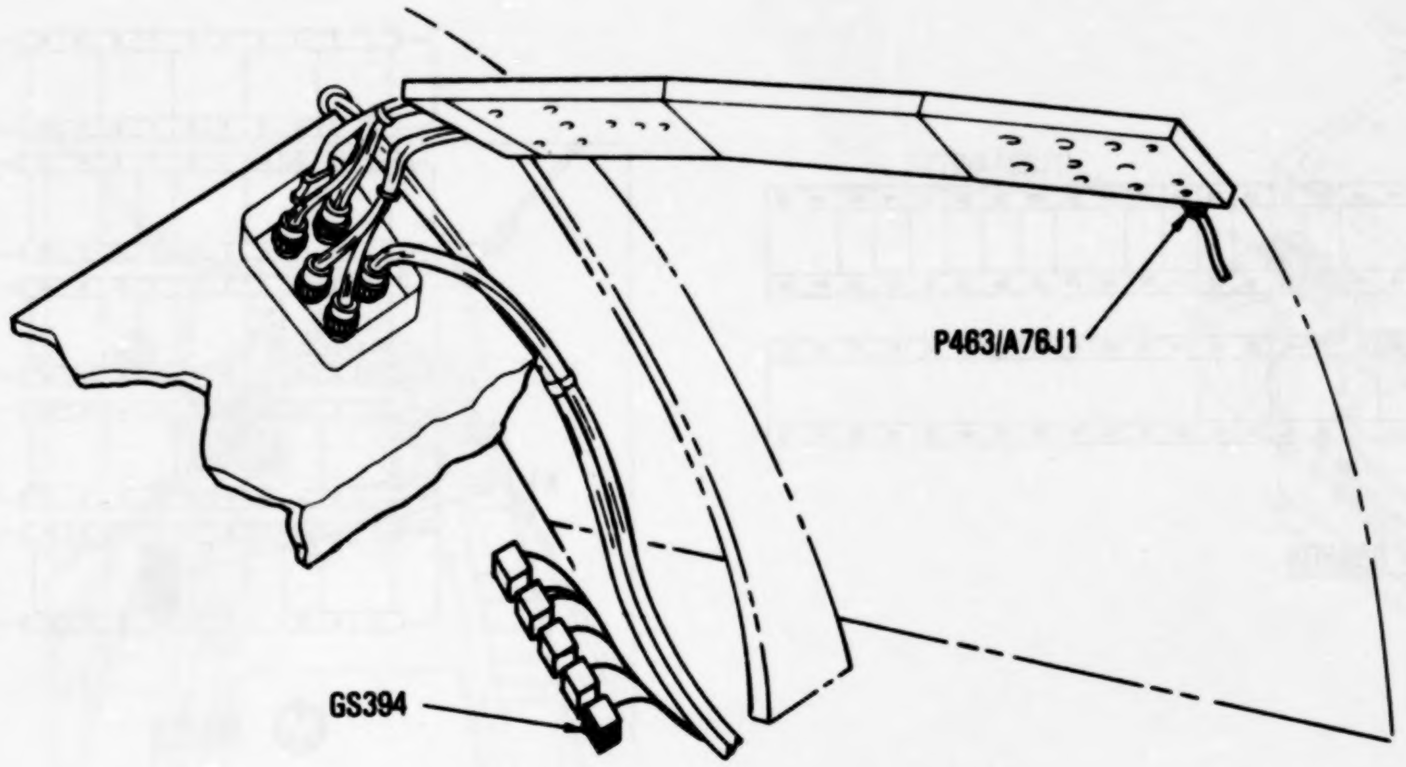
A PILOT LEFT SIDE CONSOLE


P466/J14
P480/J16

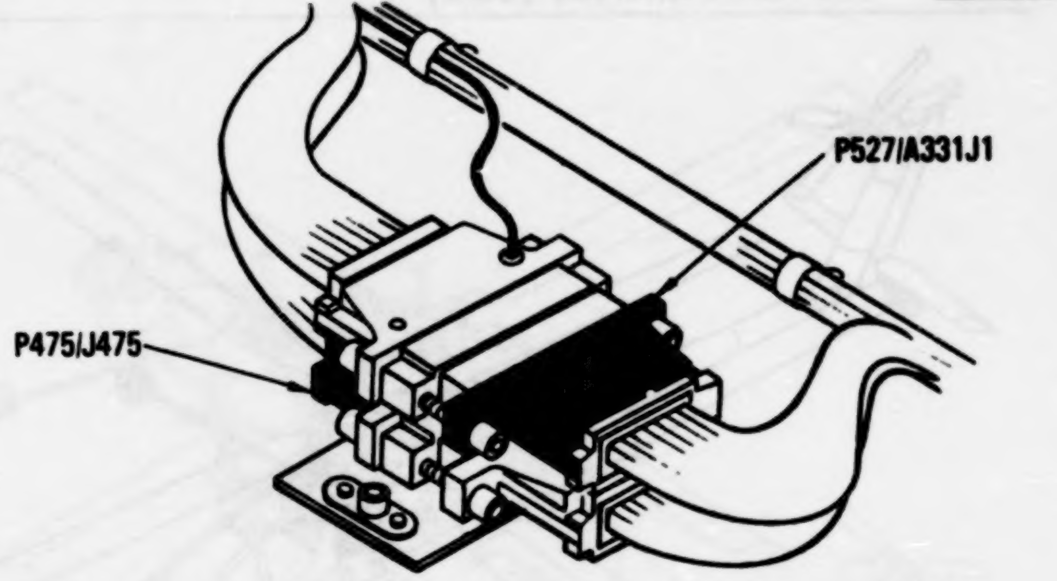
H PILOT MATRIX MODULE (ROTATED)

MM04/1-1102-1B

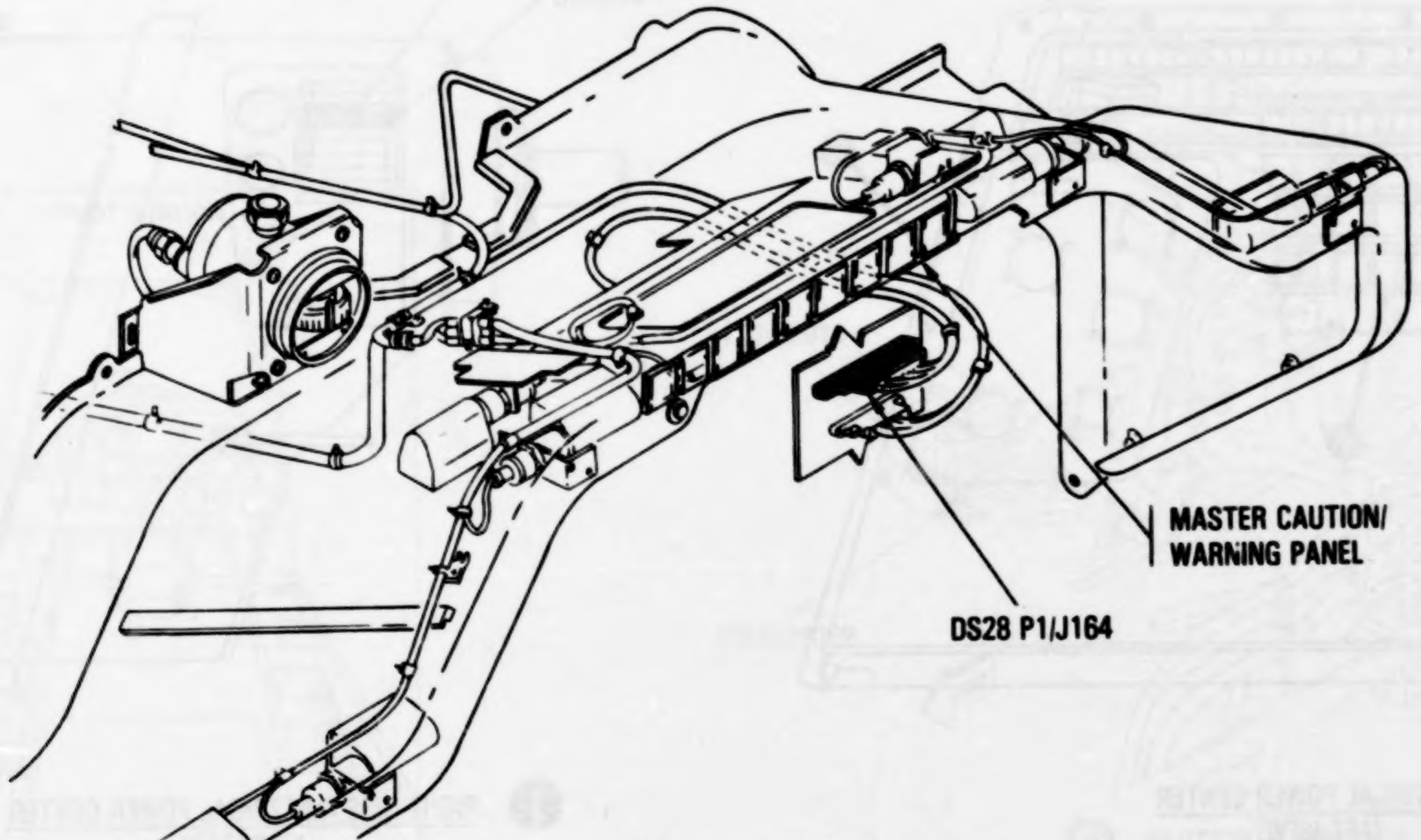
9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


P463/A76J1
GS394

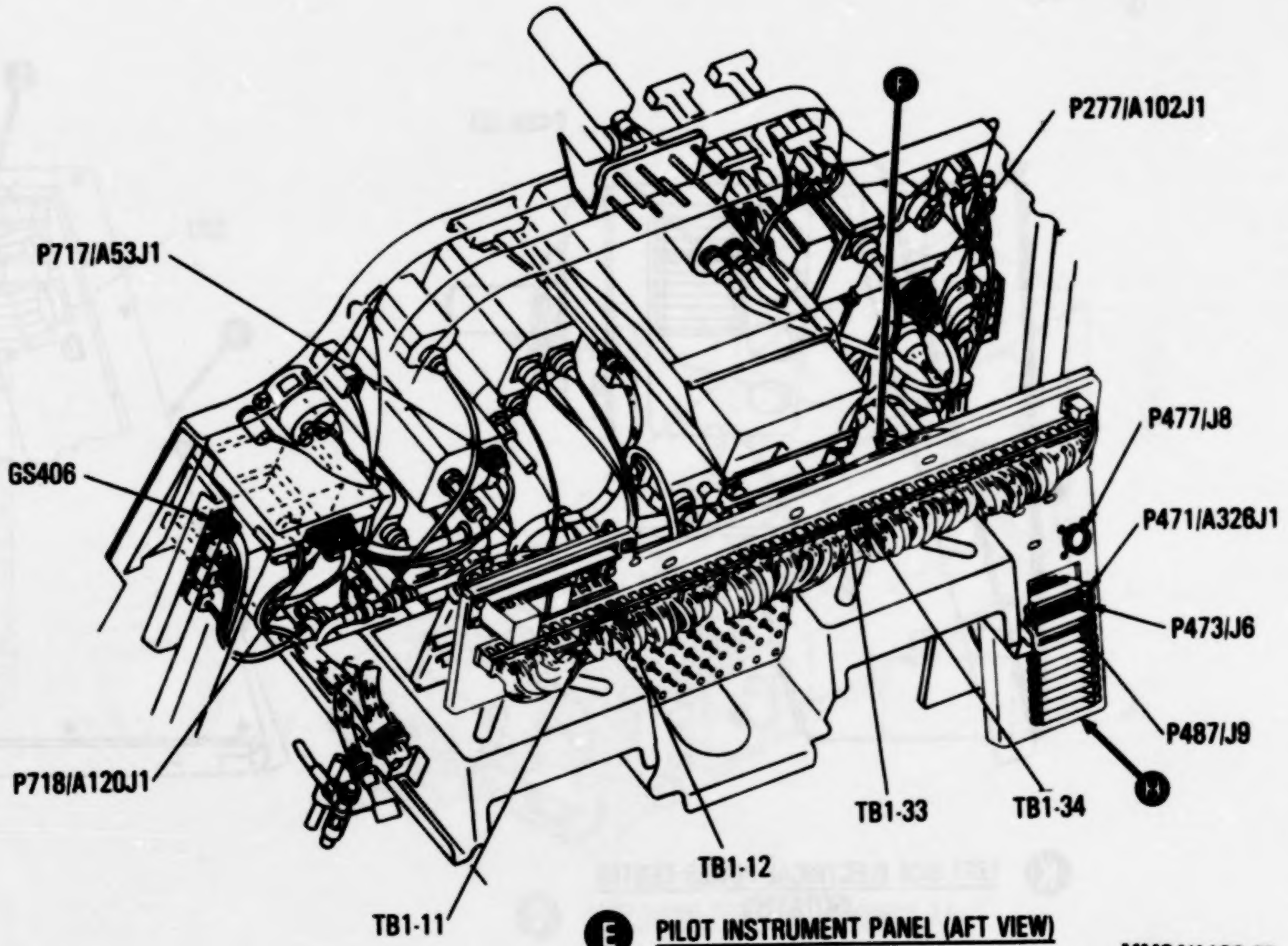
G PILOT CIRCUIT BREAKER PANEL (AFT VIEW)


P527/A331J1
P475/J475

F INSTRUMENT PANEL WIRING DETAIL


MASTER CAUTION/ WARNING PANEL
DS28 P1/J164

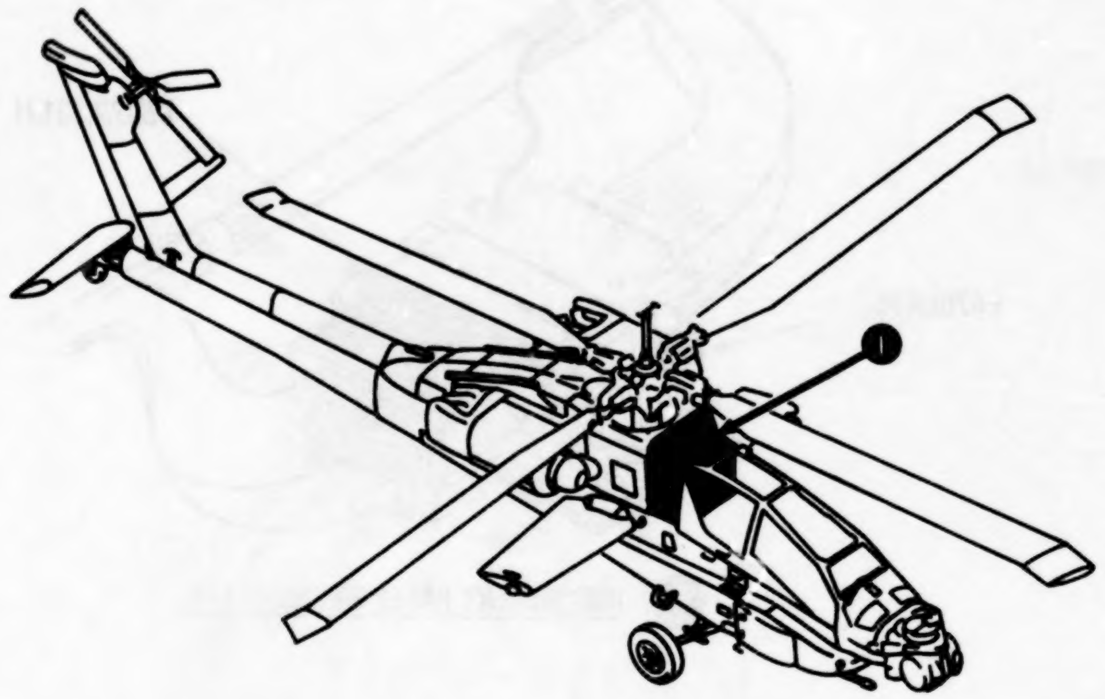
D PILOT GLARESHIELD PANEL

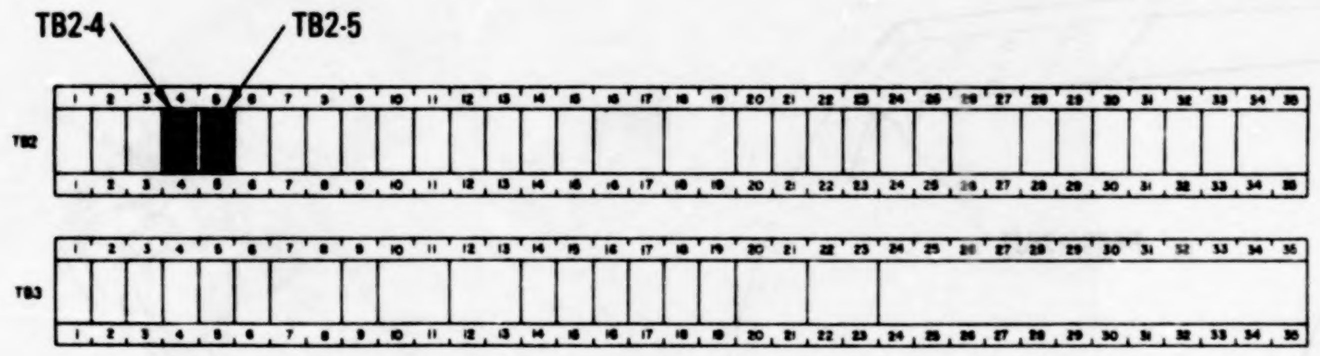

F
P277/A102J1
P717/A53J1
GS406
P477/J8
P471/A326J1
P473/J6
P487/J9
H
P718/A120J1
TB1-33
TB1-34
TB1-12
TB1-11

E PILOT INSTRUMENT PANEL (AFT VIEW)

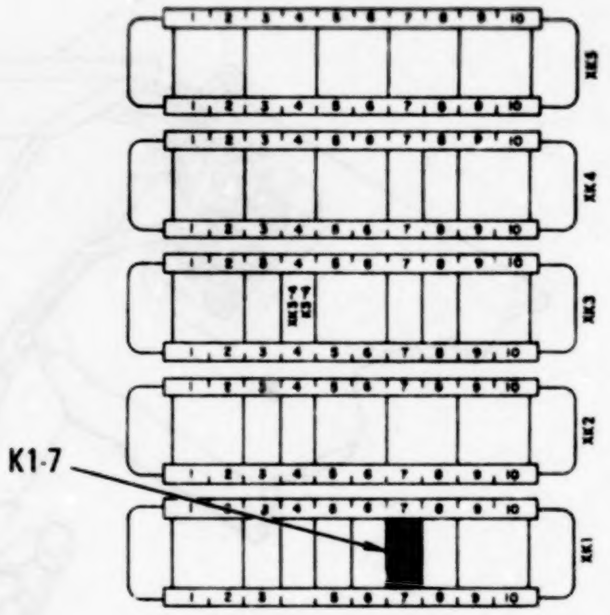
MM04/1102-28

9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

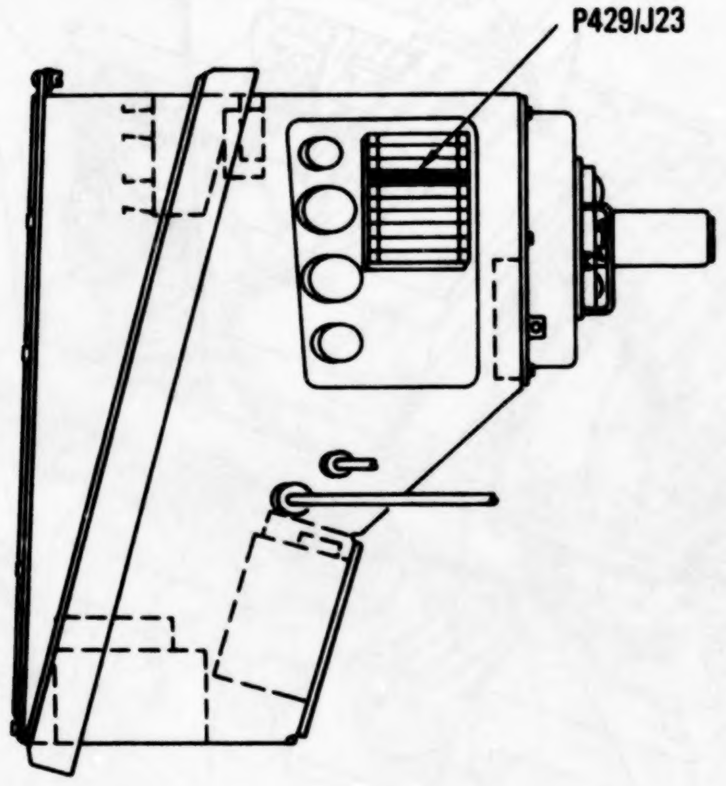



TB2-4
TB2-5
TB2
TB3

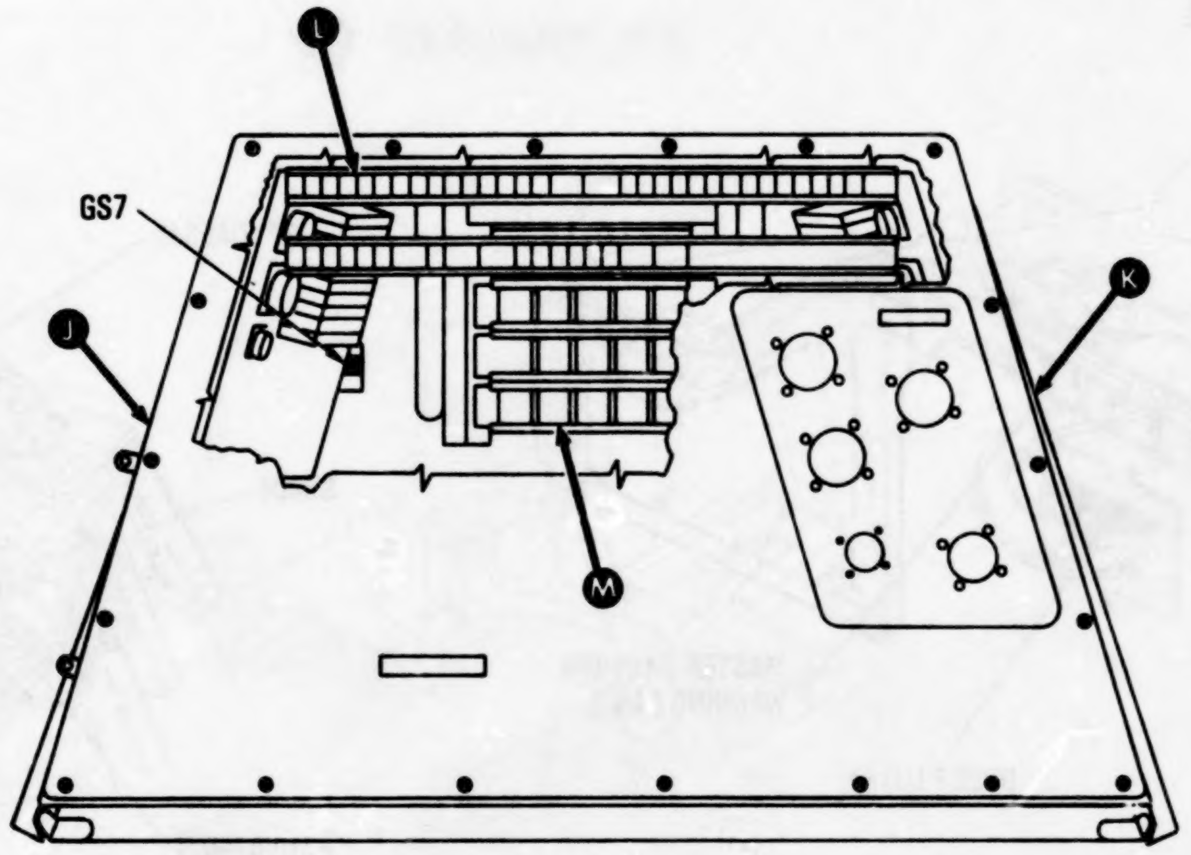
Ⓛ TERMINAL BOARDS


K1-7
XK5
XK4
XK3
XK2
XK1

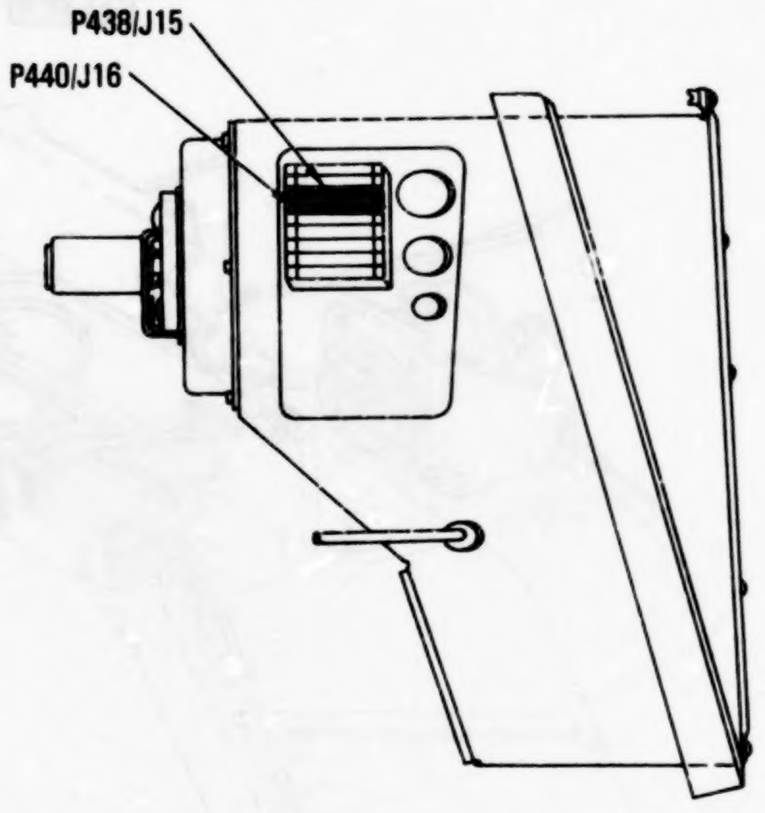
Ⓜ RELAYS



Ⓚ LEFT SIDE ELECTRICAL POWER CENTER (ROTATED)



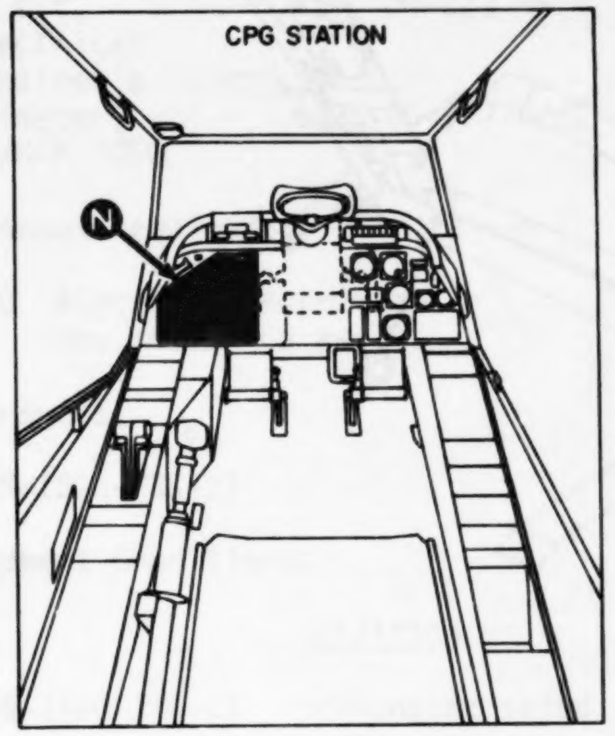
Ⓘ ELECTRICAL POWER CENTER (AFT VIEW)

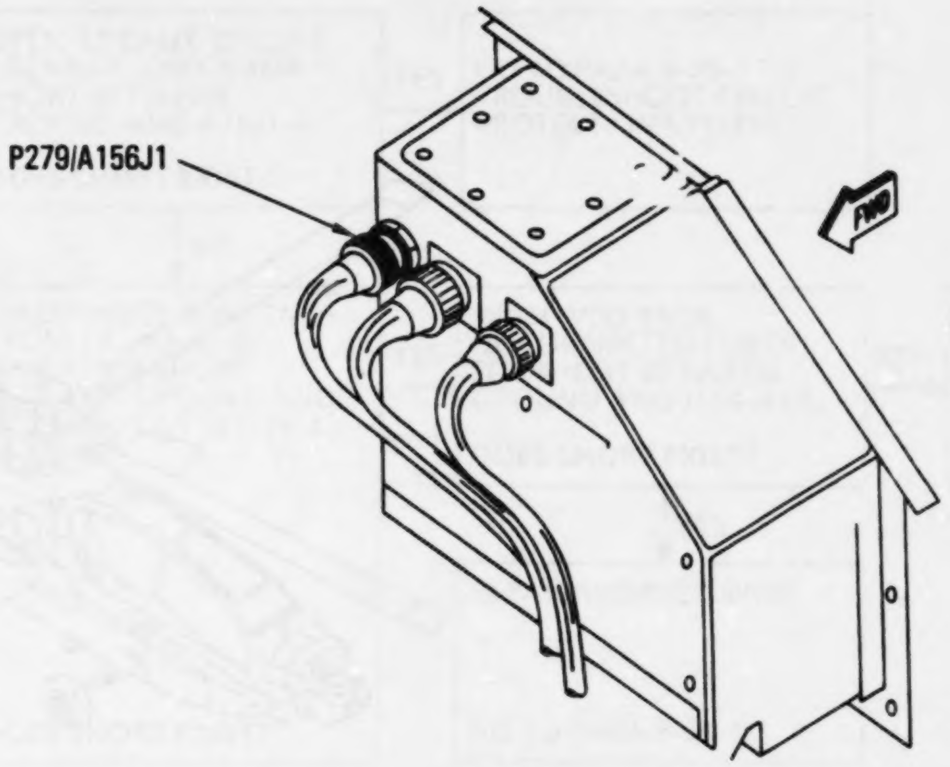

P438/J15
P440/J16

MM04/1-1102-3A

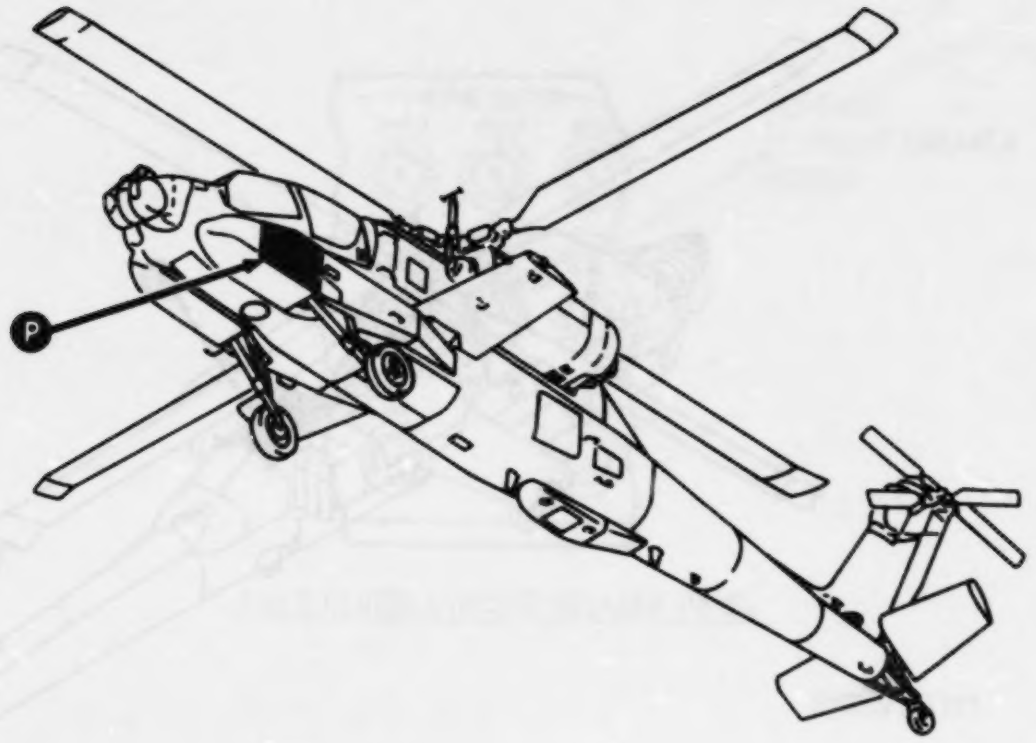
Ⓙ RIGHT SIDE ELECTRICAL POWER CENTER (ROTATED)

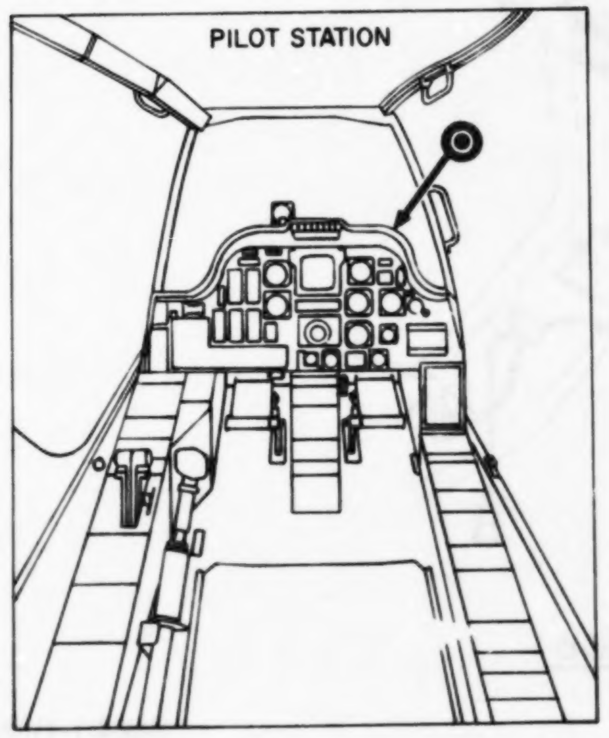
9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

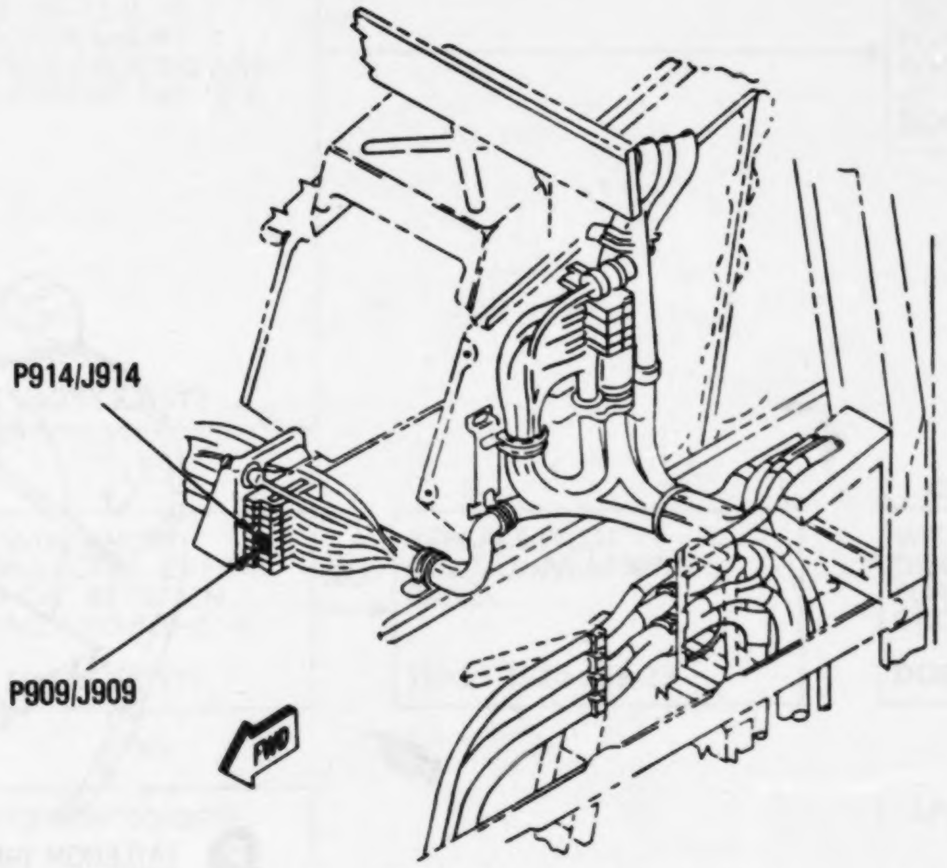

CPG STATION
N


P279/A156J1
FWD

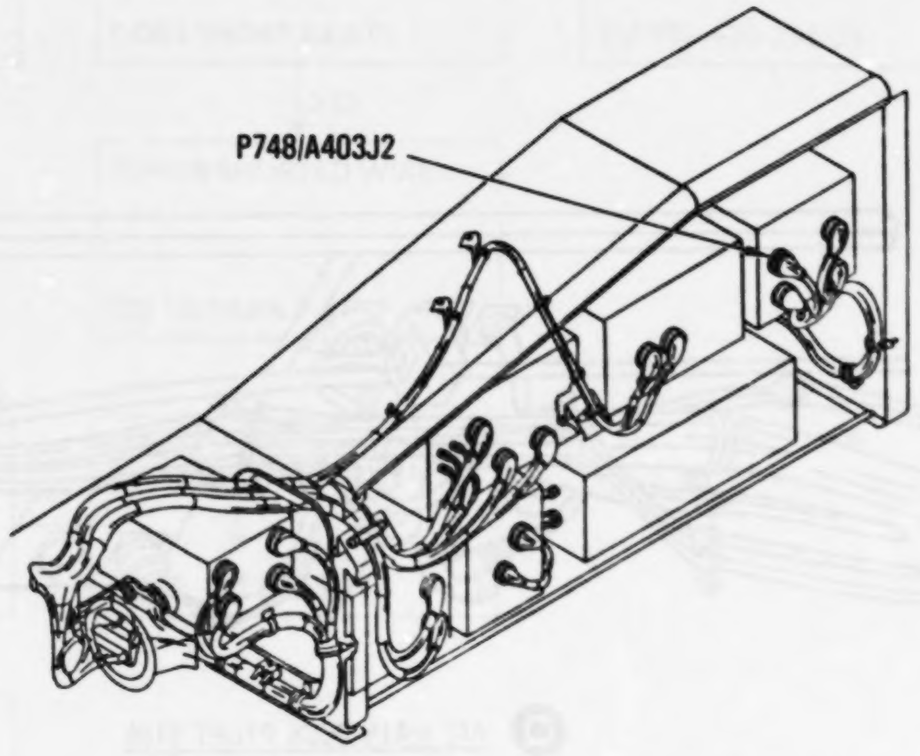
N CPG INSTRUMENT PANEL




PILOT STATION
O


P914/J914
P909/J909
FWD

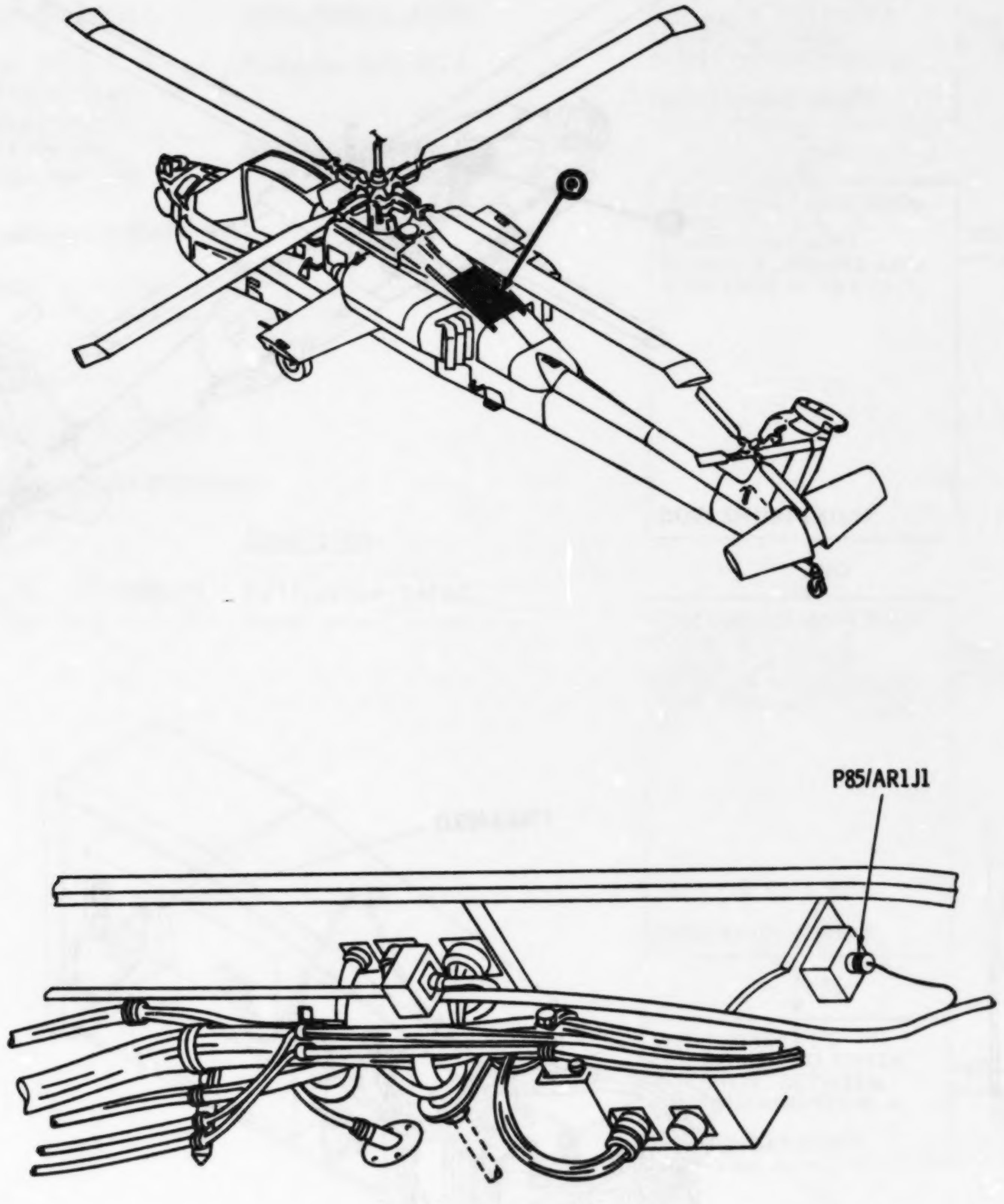
O PILOT/CPG CROSSOVER


P748/A403J2

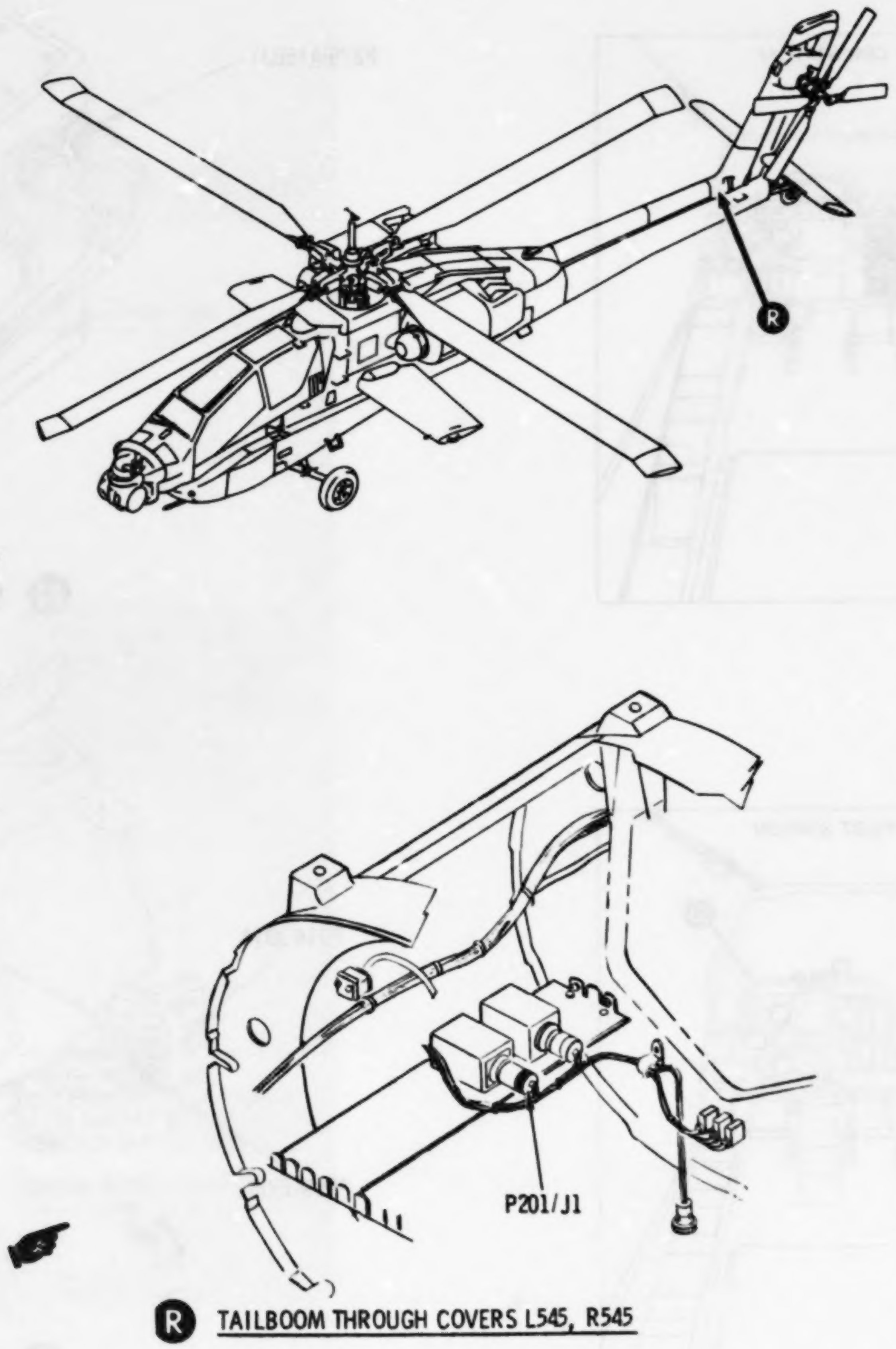
P LEFT HAND FORWARD AVIONICS BAY

MM04/1-1102-4A

9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



Q AFT MAIN DECK RIGHT SIDE



R TAILBOOM THROUGH COVERS L545, R545

MM04/1-1102-5B

9-31-4. LT CAUT CIRCUIT BREAKER (CB21) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

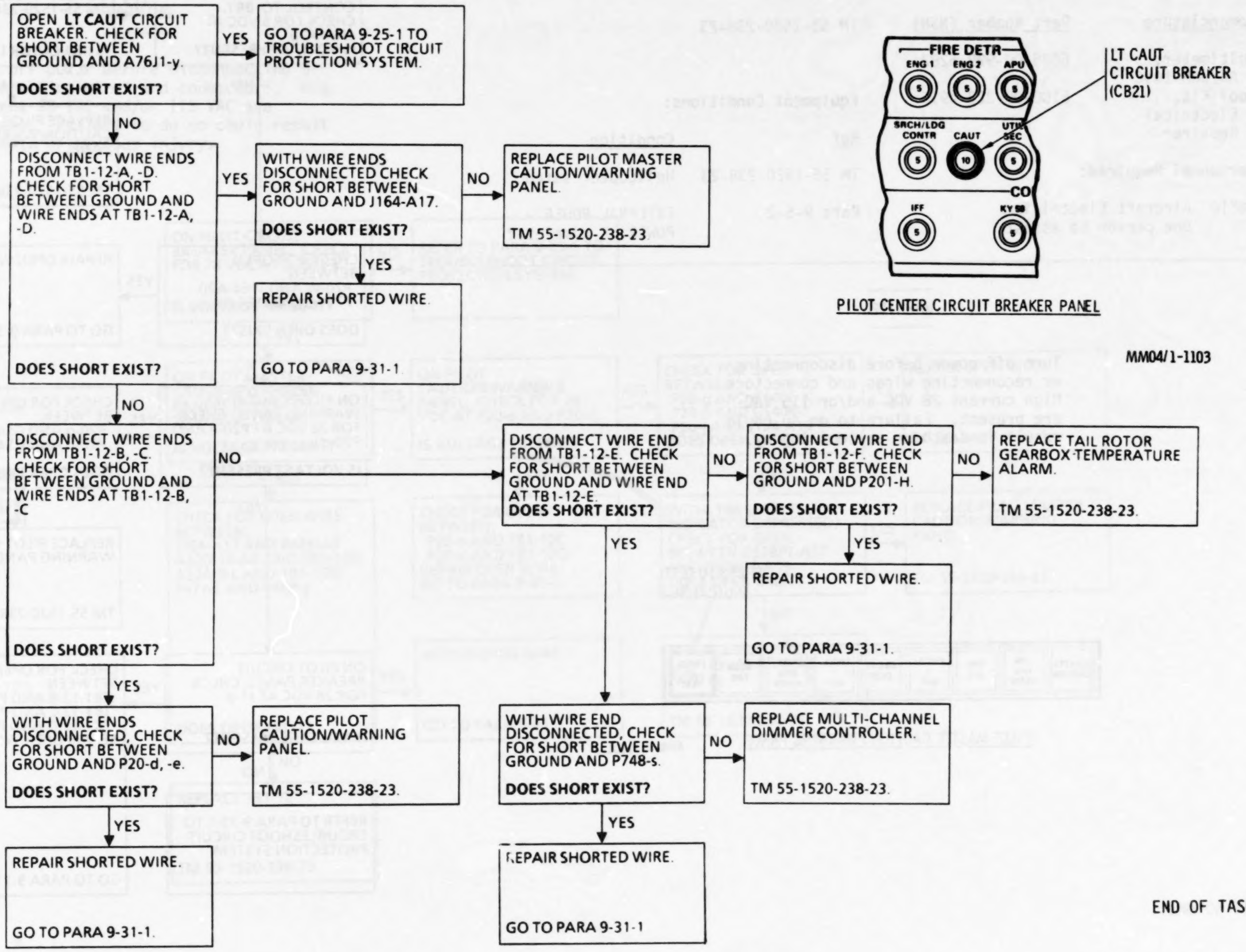
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN LT CAUT CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76J1-y.
DOES SHORT EXIST?
YES
GO TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT WIRE ENDS FROM TB1-12-A, -D. CHECK FOR SHORT BETWEEN GROUND AND WIRE ENDS AT TB1-12-A, -D.
DOES SHORT EXIST?
YES
WITH WIRE ENDS DISCONNECTED CHECK FOR SHORT BETWEEN GROUND AND J164-A17.
DOES SHORT EXIST?
NO
REPLACE PILOT MASTER CAUTION/WARNING PANEL
TM 55-1520-238-23
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-31-1
NO
DISCONNECT WIRE ENDS FROM TB1-12-B, -C. CHECK FOR SHORT BETWEEN GROUND AND WIRE ENDS AT TB1-12-B, -C
DOES SHORT EXIST?
NO
DISCONNECT WIRE END FROM TB1-12-E. CHECK FOR SHORT BETWEEN GROUND AND WIRE END AT TB1-12-E.
DOES SHORT EXIST?
NO
DISCONNECT WIRE END FROM TB1-12-F. CHECK FOR SHORT BETWEEN GROUND AND P201-H.
DOES SHORT EXIST?
NO
REPLACE TAIL ROTOR GEARBOX TEMPERATURE ALARM.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-31-1.
YES
WITH WIRE ENDS DISCONNECTED, CHECK FOR SHORT BETWEEN GROUND AND P20-d, -e.
DOES SHORT EXIST?
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-31-1.
YES
WITH WIRE END DISCONNECTED, CHECK FOR SHORT BETWEEN GROUND AND P748-s.
DOES SHORT EXIST?
NO
REPLACE MULTI-CHANNEL DIMMER CONTROLLER.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-31-1
FIRE DETR
ENG 1
ENG 2
APU
SRCH/LDG CONTR
CAUT
UTIL SEC
CO
IFF
KY 58
5
10
LT CAUT CIRCUIT BREAKER (CB21)

PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1103

END OF TASK

9-31-5. PRESS TO TEST INDICATOR - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

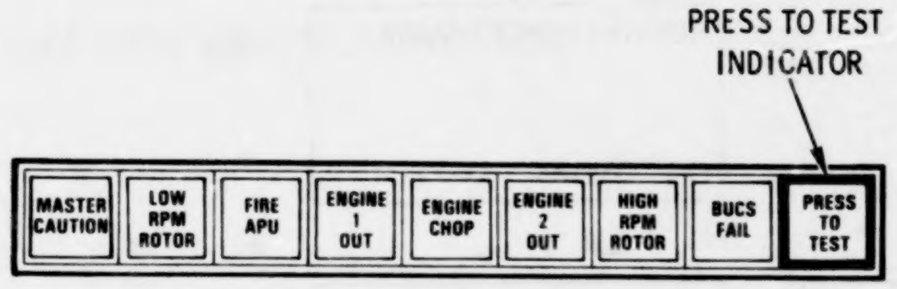
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

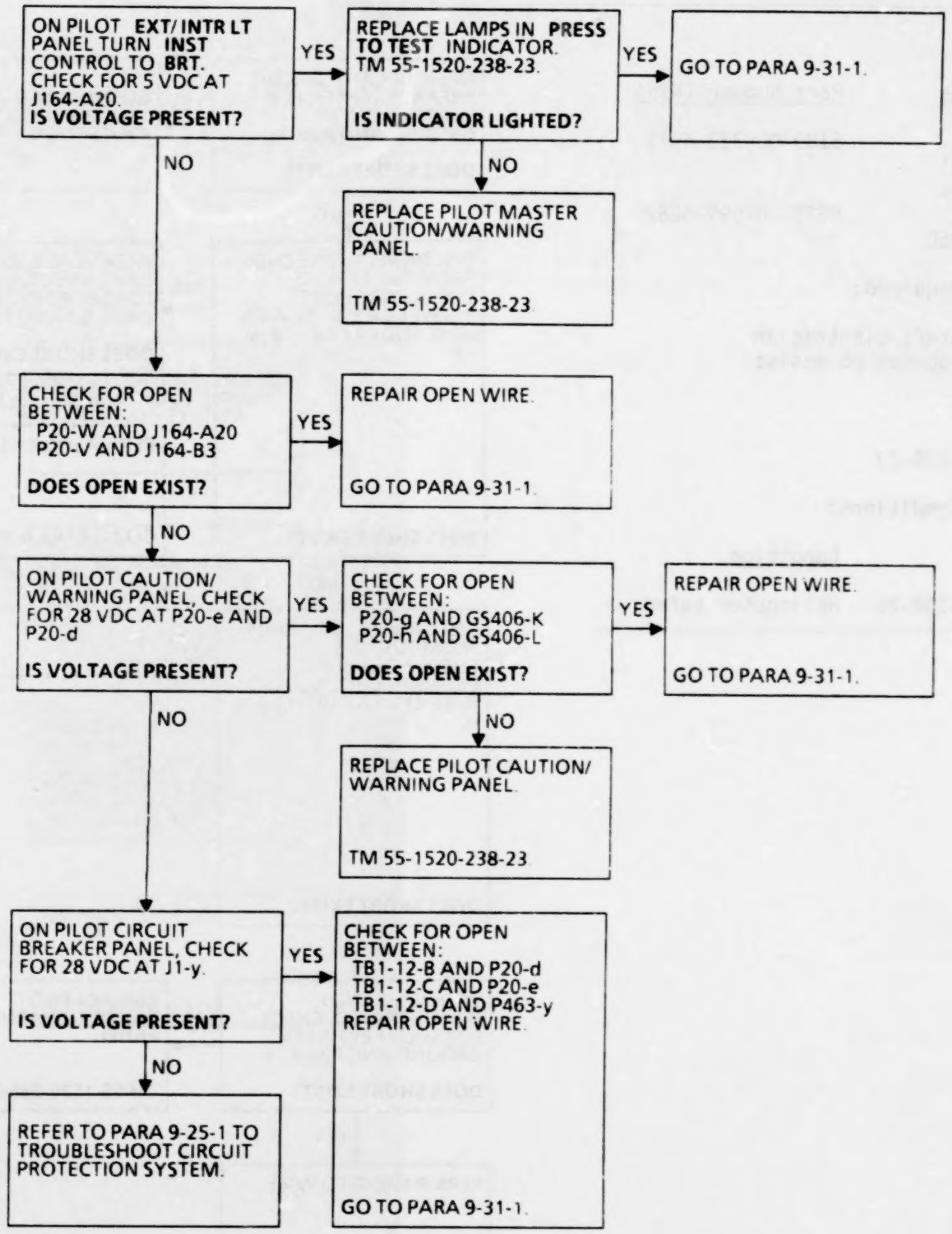
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


PRESS TO TEST
INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

PILOT MASTER CAUTION / WARNING PANEL

MM04/1-1104


YES
NO
YES
NO
YES
NO
YES
NO
YES
NO
YES
NO

ON PILOT EXT/INTR LT PANEL TURN INST CONTROL TO BRT. CHECK FOR 5 VDC AT J164-A20. **IS VOLTAGE PRESENT?**

REPLACE LAMPS IN PRESS TO TEST INDICATOR. TM 55-1520-238-23. **IS INDICATOR LIGHTED?**

GO TO PARA 9-31-1.

REPLACE PILOT MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23

CHECK FOR OPEN BETWEEN: P20-W AND J164-A20 P20-V AND J164-B3 **DOES OPEN EXIST?**

REPAIR OPEN WIRE. GO TO PARA 9-31-1.

ON PILOT CAUTION/ WARNING PANEL, CHECK FOR 28 VDC AT P20-e AND P20-d **IS VOLTAGE PRESENT?**

CHECK FOR OPEN BETWEEN: P20-g AND GS406-K P20-h AND GS406-L **DOES OPEN EXIST?**

REPAIR OPEN WIRE. GO TO PARA 9-31-1.

REPLACE PILOT CAUTION/ WARNING PANEL. TM 55-1520-238-23

ON PILOT CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT J1-y. **IS VOLTAGE PRESENT?**

CHECK FOR OPEN BETWEEN: TB1-12-B AND P20-d TB1-12-C AND P20-e TB1-12-D AND P463-y REPAIR OPEN WIRE. GO TO PARA 9-31-1.

REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

END OF TASK

9-31-6. MASTER CAUTION/WARNING AND CAUTION/WARNING PANELS - ARE NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-5)

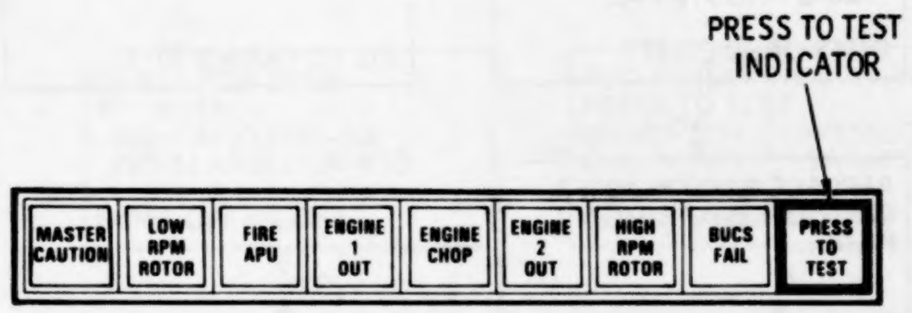
Personnel Required: (para 9-31-5)

References: (para 9-31-5)

Equipment Conditions: (para 9-31-5)

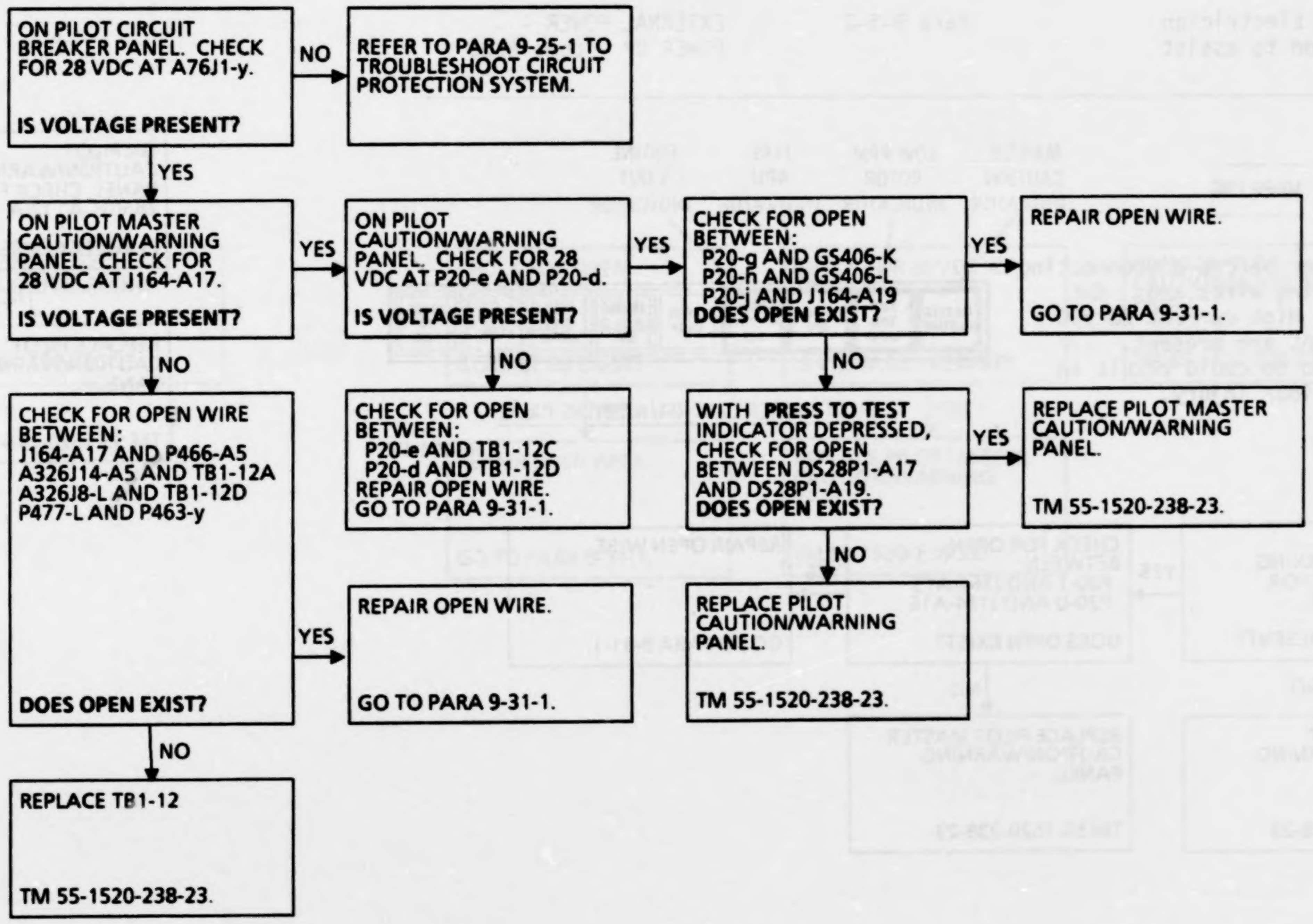
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


PRESS TO TEST INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

PILOT MASTER CAUTION / WARNING PANEL

MM04/1-1105


ON PILOT CIRCUIT BREAKER PANEL. CHECK FOR 28 VDC AT A76J1-y.
IS VOLTAGE PRESENT?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
ON PILOT MASTER CAUTION/WARNING PANEL. CHECK FOR 28 VDC AT J164-A17.
IS VOLTAGE PRESENT?
YES
ON PILOT CAUTION/WARNING PANEL. CHECK FOR 28 VDC AT P20-e AND P20-d.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P20-g AND GS406-K
P20-h AND GS406-L
P20-j AND J164-A19
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
CHECK FOR OPEN WIRE BETWEEN:
J164-A17 AND P466-A5
A326J14-A5 AND TB1-12A
A326J8-L AND TB1-12D
P477-L AND P463-y
DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN:
P20-e AND TB1-12C
P20-d AND TB1-12D
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
WITH PRESS TO TEST INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS28P1-A17 AND DS28P1-A19.
DOES OPEN EXIST?
YES
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE TB1-12
TM 55-1520-238-23.

END OF TASK

9-31-7. MASTER CAUTION INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

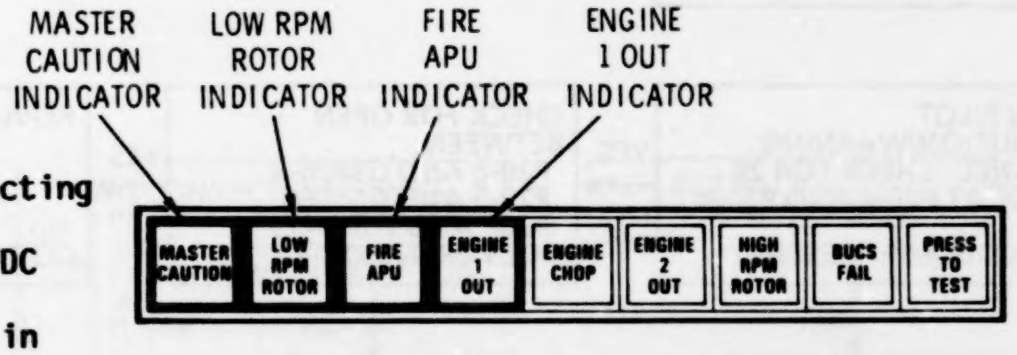
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP - completed

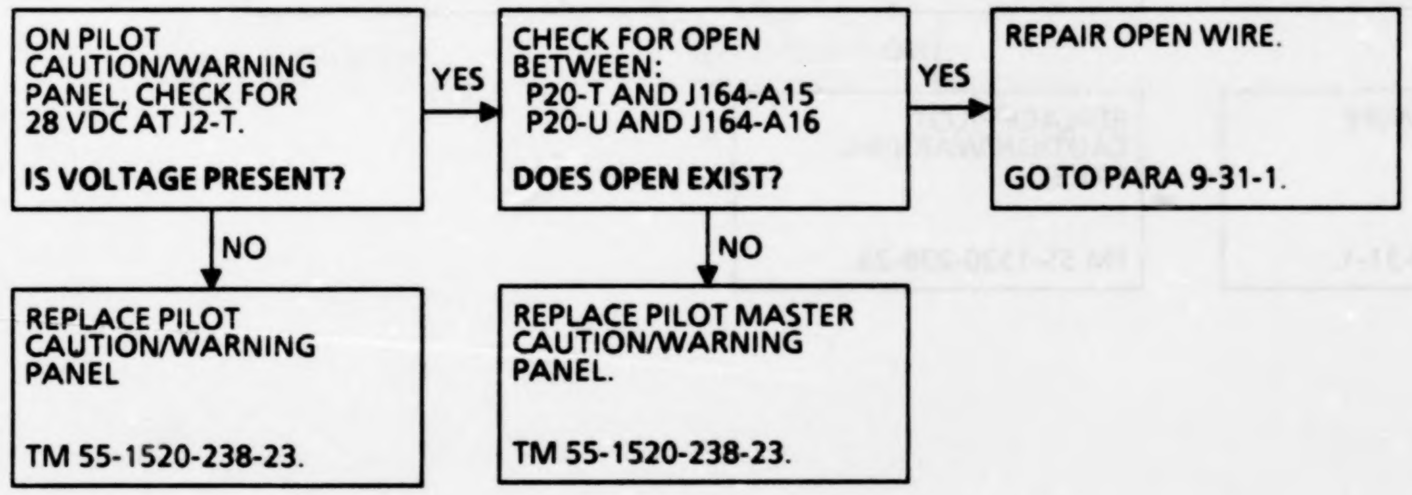
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


MASTER CAUTION INDICATOR
LOW RPM ROTOR INDICATOR
FIRE APU INDICATOR
ENGINE 1 OUT INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

PILOT MASTER CAUTION/WARNING PANEL

MM04/1-1161


YES
YES
NO
NO

ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-T.
IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P20-T AND J164-A15
P20-U AND J164-A16
DOES OPEN EXIST?

REPAIR OPEN WIRE.
GO TO PARA 9-31-1.

REPLACE PILOT CAUTION/WARNING PANEL
TM 55-1520-238-23.

REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-8. LOW RPM ROTOR INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-7)

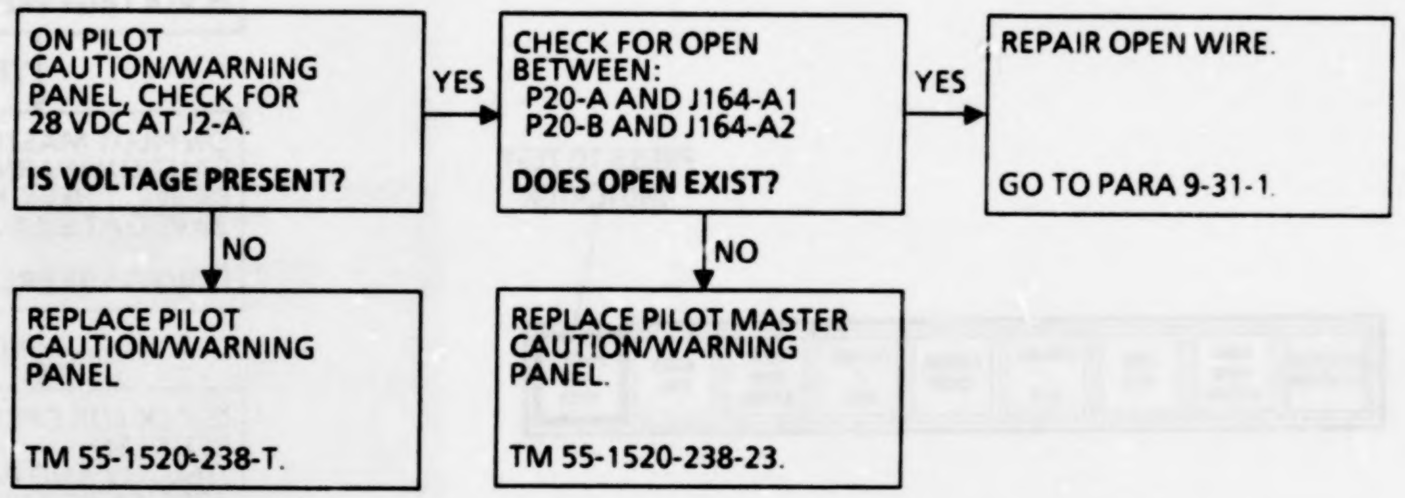
Personnel Required: (para 9-31-7)

References: (para 9-31-7)

Equipment Conditions: (para 9-31-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


YES
YES
NO
NO

ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-A.
IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P20-A AND J164-A1
P20-B AND J164-A2
DOES OPEN EXIST?

REPAIR OPEN WIRE.
GO TO PARA 9-31-1.

REPLACE PILOT CAUTION/WARNING PANEL
TM 55-1520-238-T.

REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-9. FIRE APU INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-7)

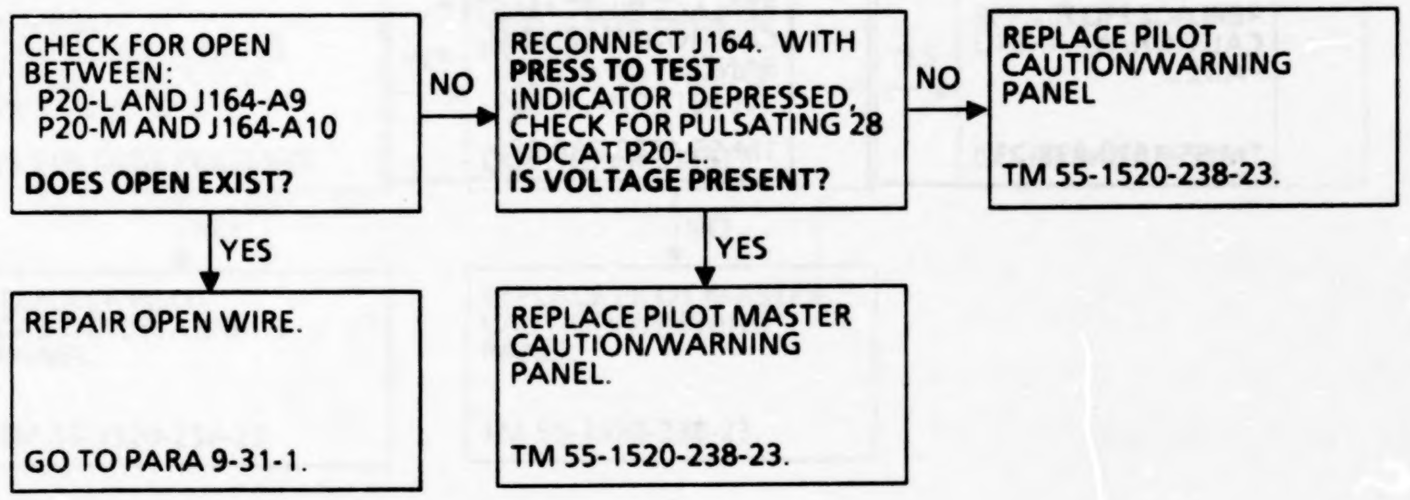
Personnel Required: (para 9-31-7)

References: (para 9-31-7)

Equipment Conditions: (para 9-31-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR OPEN BETWEEN:
P20-L AND J164-A9
P20-M AND J164-A10
DOES OPEN EXIST?
NO
RECONNECT J164. WITH PRESS TO TEST INDICATOR DEPRESSED, CHECK FOR PULSATING 28 VDC AT P20-L.
IS VOLTAGE PRESENT?
NO
REPLACE PILOT CAUTION/WARNING PANEL
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
YES
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-10. ENGINE 1 OUT INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-7)

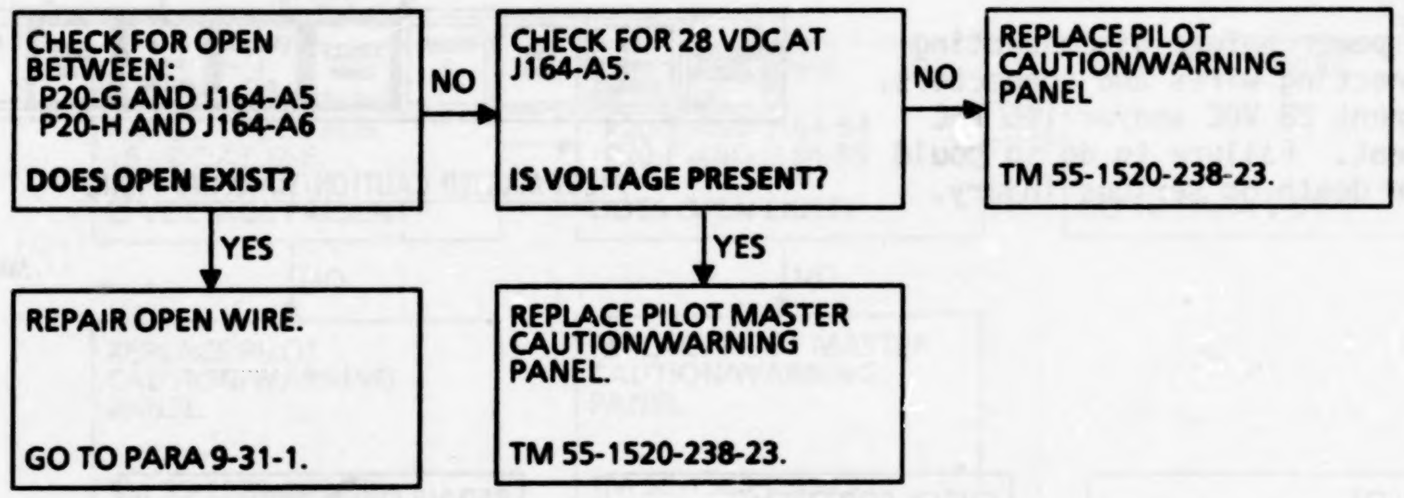
Personnel Required: (para 9-31-7)

References: (para 9-31-7)

Equipment Conditions: (para 9-31-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR OPEN BETWEEN:
P20-G AND J164-A5
P20-H AND J164-A6
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT J164-A5.
IS VOLTAGE PRESENT?
NO
REPLACE PILOT CAUTION/WARNING PANEL
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
YES
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-11. ENGINE CHOP INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

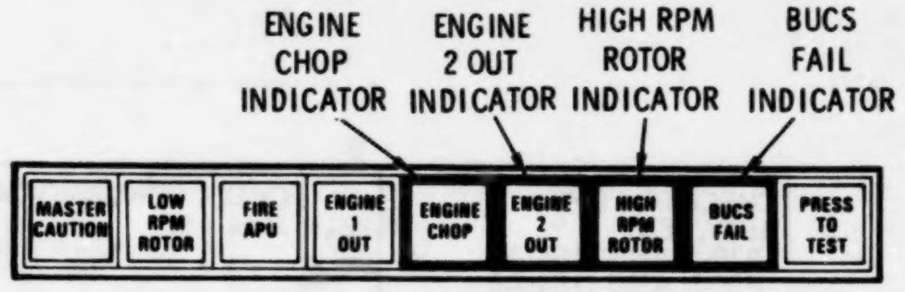
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

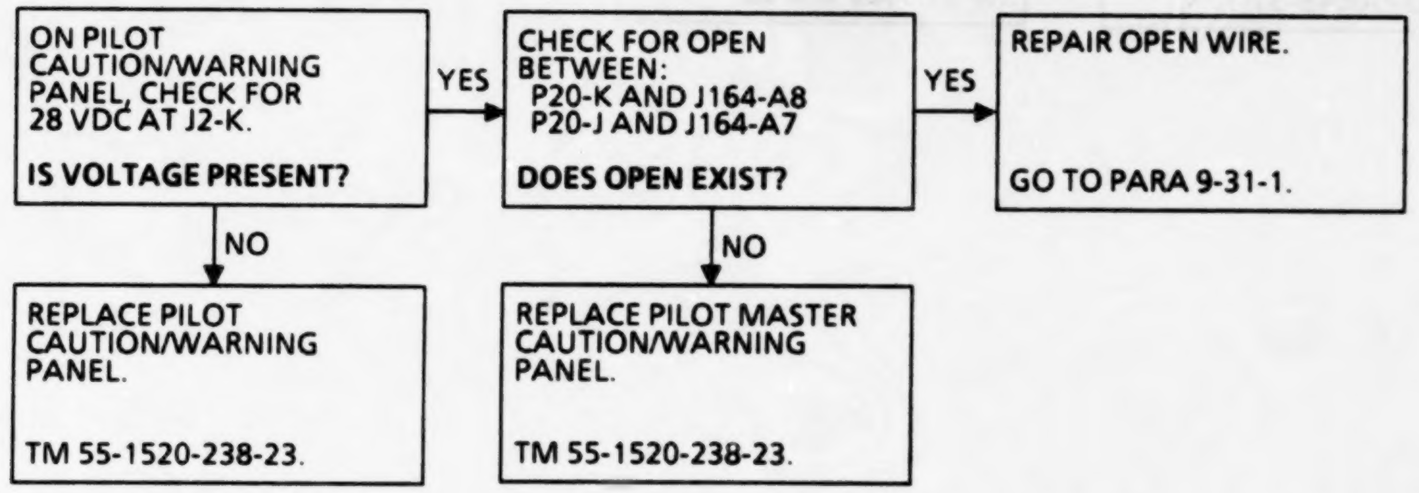
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ENGINE CHOP INDICATOR
ENGINE 2 OUT INDICATOR
HIGH RPM ROTOR INDICATOR
BUCS FAIL INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

PILOT MASTER CAUTION/WARNING PANEL

MM04/1-1162


ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-K.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P20-K AND J164-A8
P20-J AND J164-A7
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-12. ENGINE 2 OUT INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-11)

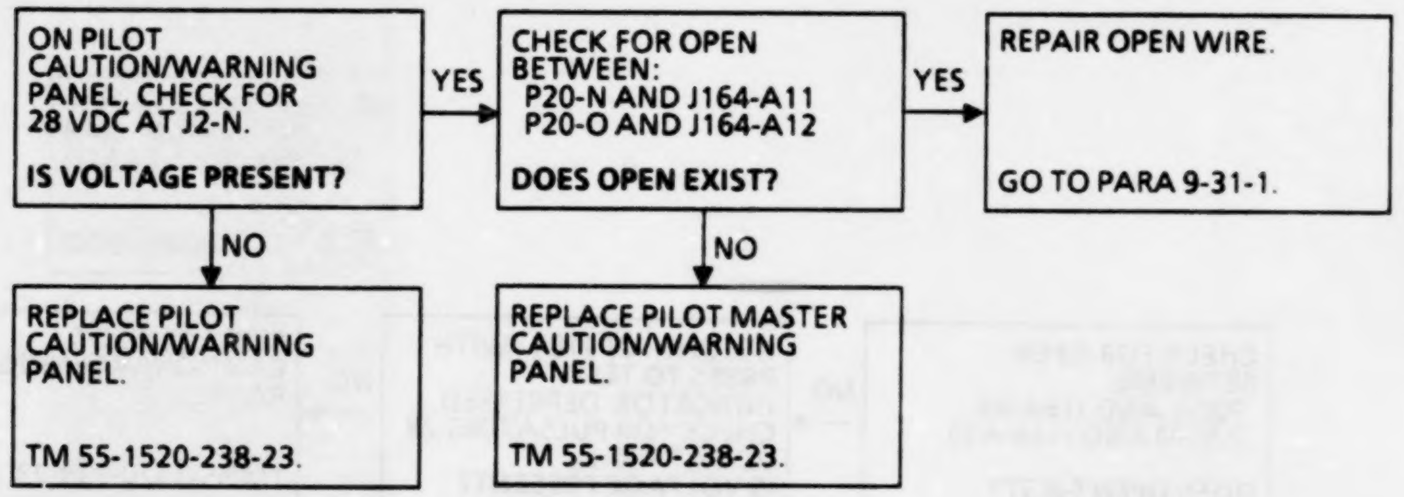
Personnel Required: (para 9-31-11)

References: (para 9-31-11)

Equipment Conditions: (para 9-31-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-N.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P20-N AND J164-A11
P20-O AND J164-A12
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-13. HIGH RPM ROTOR INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-11)

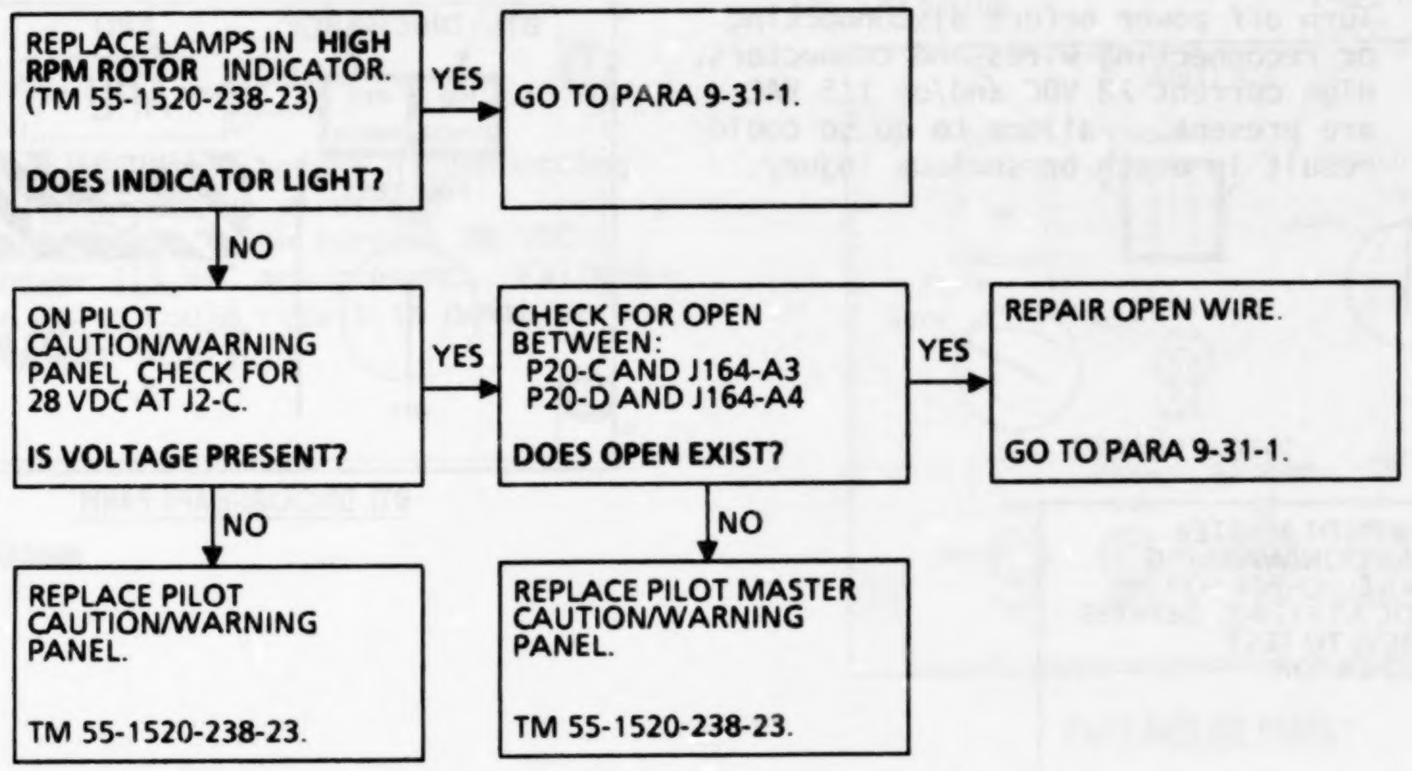
Personnel Required: (para 9-31-11)

References: (para 9-31-11)

Equipment Conditions: (para 9-31-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


REPLACE LAMPS IN HIGH RPM ROTOR INDICATOR. (TM 55-1520-238-23)
DOES INDICATOR LIGHT?
YES
GO TO PARA 9-31-1.
NO
ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-C.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P20-C AND J164-A3 P20-D AND J164-A4
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-14. BUCS FAIL INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-11))

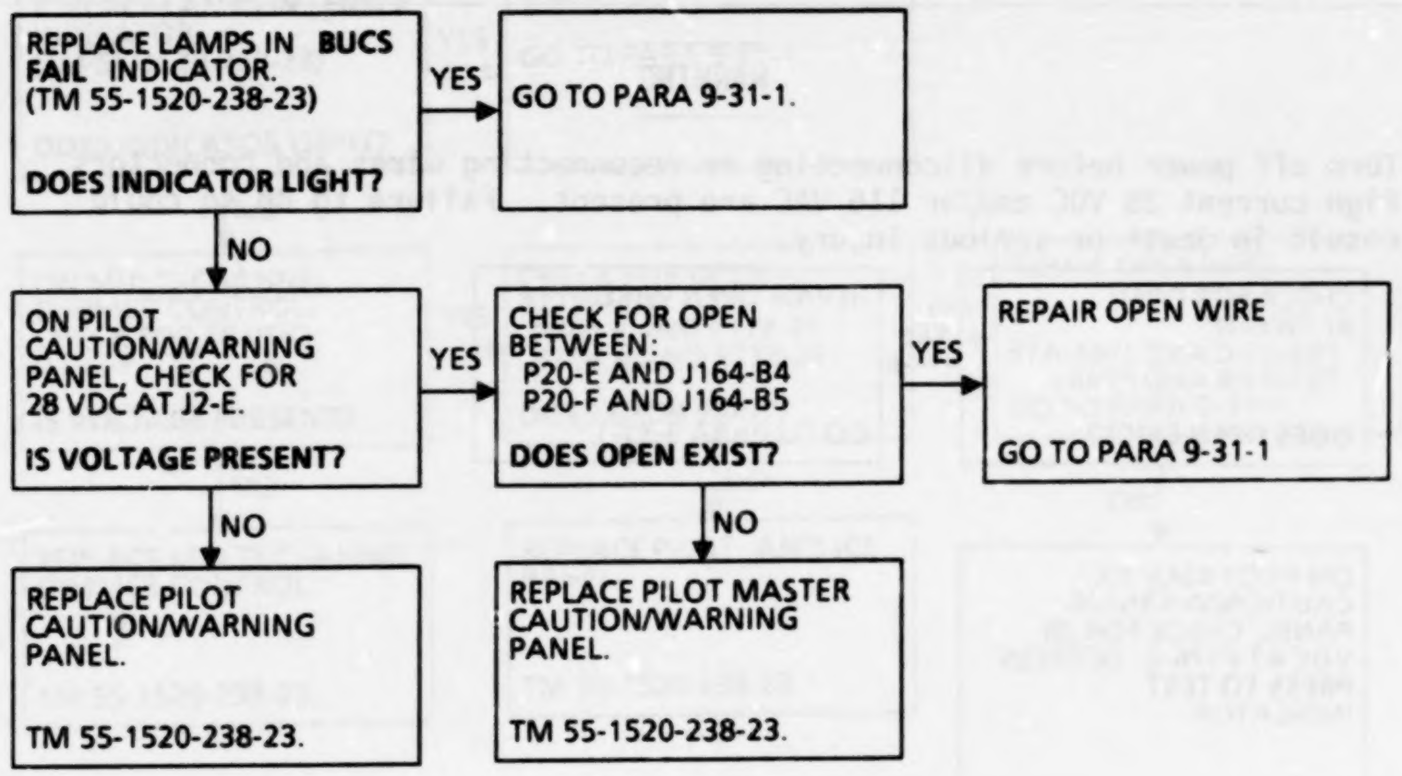
Personnel Required: (para 9-31-11)

References: (para 9-31-11)

Equipment Conditions: (para 9-31-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


REPLACE LAMPS IN BUCS FAIL INDICATOR. (TM 55-1520-238-23)
DOES INDICATOR LIGHT?
YES
GO TO PARA 9-31-1.
NO
ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-E.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P20-E AND J164-B4 P20-F AND J164-B5
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-31-1
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-15. PRI DISCH INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

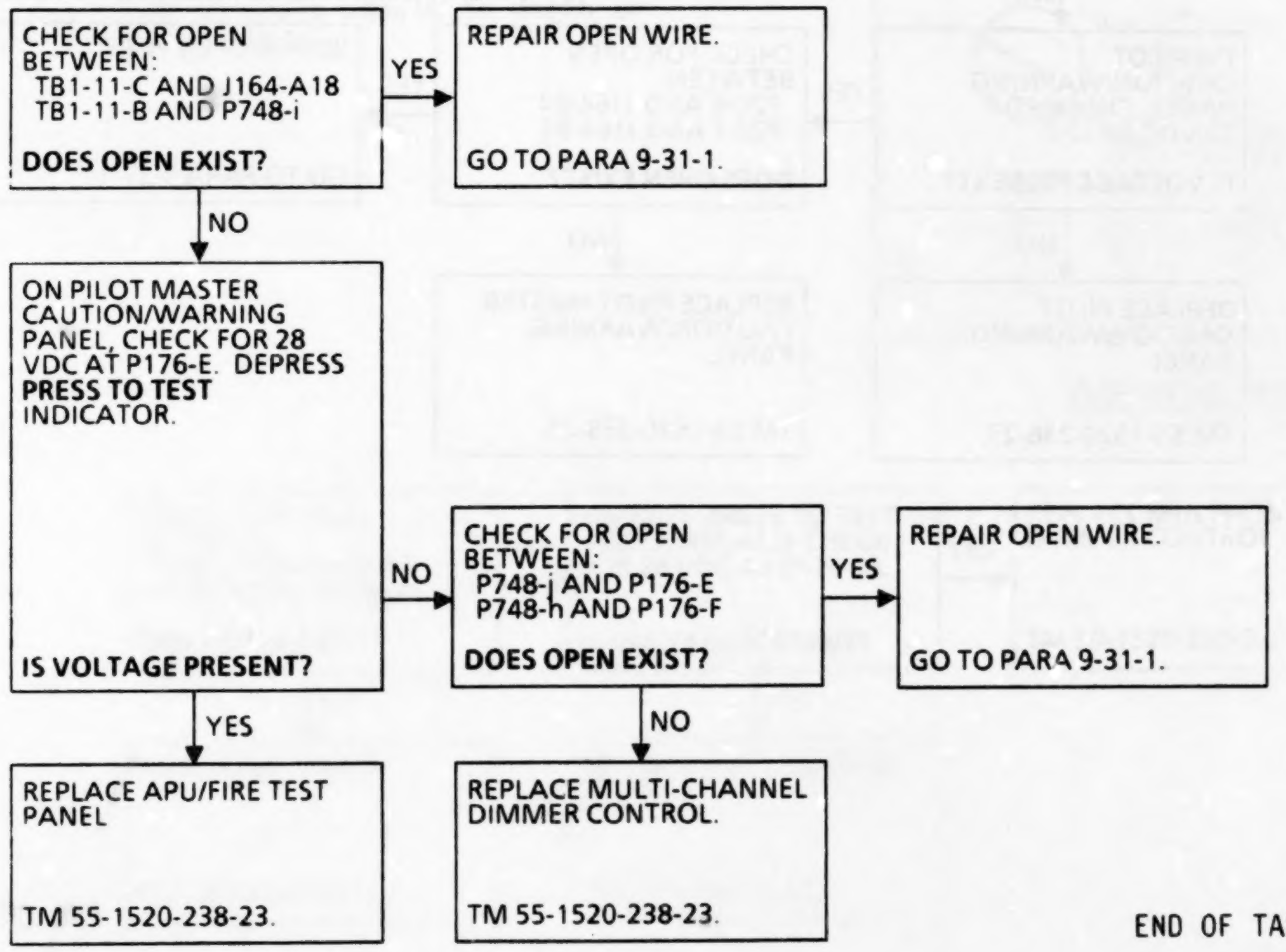
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
	Non-transparent barrier removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR OPEN BETWEEN:
TB1-11-C AND J164-A18
TB1-11-B AND P748-i
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
ON PILOT MASTER CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT P176-E. DEPRESS PRESS TO TEST INDICATOR.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN:
P748-j AND P176-E
P748-h AND P176-F
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
YES
REPLACE APU/FIRE TEST PANEL
TM 55-1520-238-23.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.

END OF TASK

9-31-16. RES DISCH INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-15)

Personnel Required: (para 9-31-15)

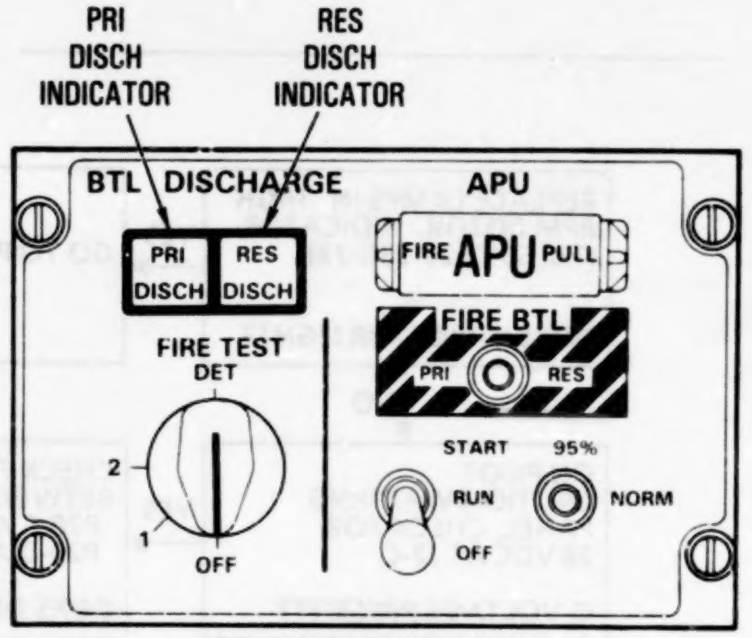
References: (para 9-31-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

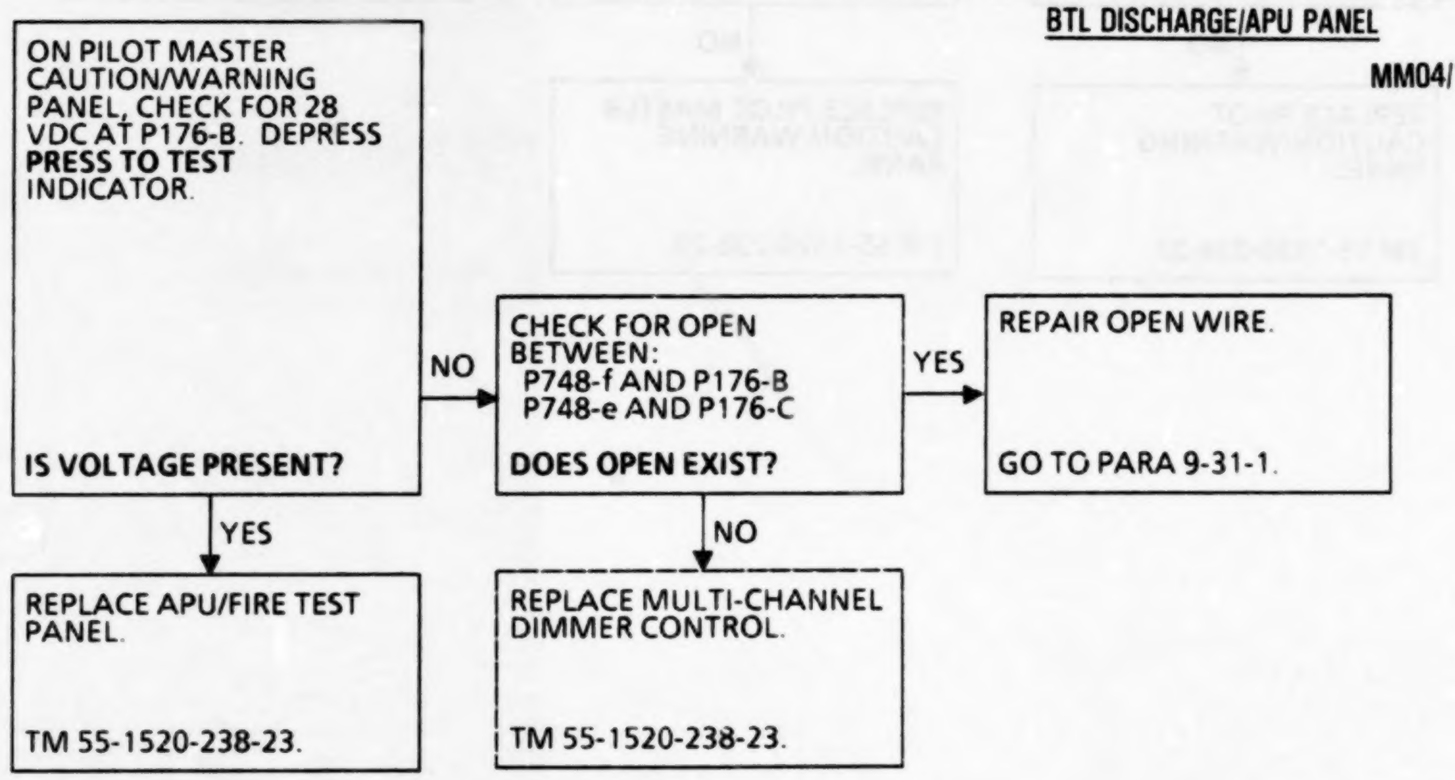
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


PRI DISCH INDICATOR
RES DISCH INDICATOR
BTL DISCHARGE
APU
PRI DISCH
RES DISCH
FIRE APU PULL
FIRE BTL
PRI
RES
FIRE TEST
DET
2
1
OFF
START
95%
RUN
NORM
OFF

BTL DISCHARGE/APU PANEL

MM04/1-1163A


ON PILOT MASTER CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT P176-B. DEPRESS PRESS TO TEST INDICATOR.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN:
P748-f AND P176-B
P748-e AND P176-C
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
YES
REPLACE APU/FIRE TEST PANEL.
TM 55-1520-238-23.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.

END OF TASK

9-31-17. ENG 1 INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-15)

Personnel Required: (para 9-31-15)

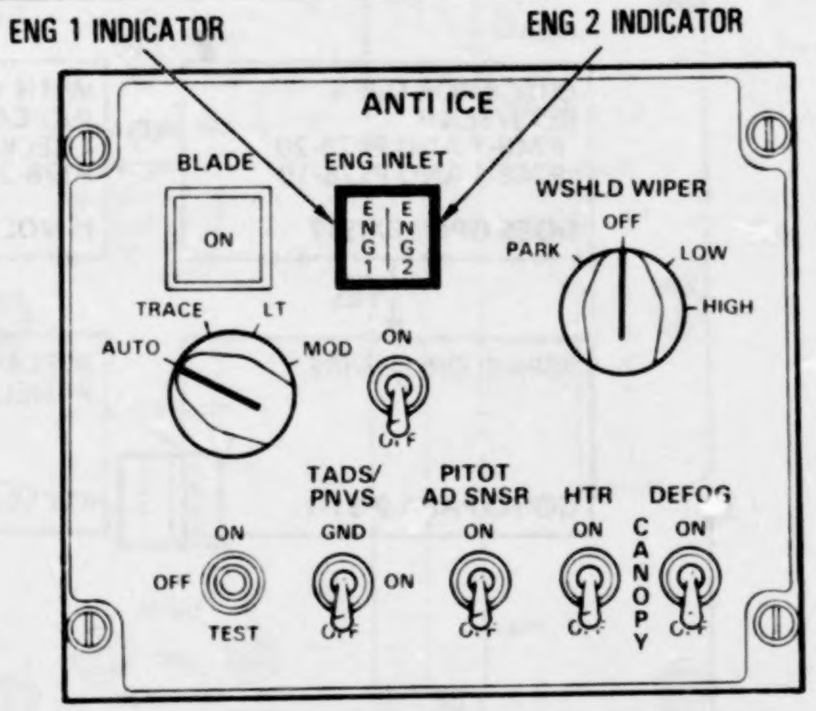
References: (para 9-31-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicoper safed Access provisions - L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

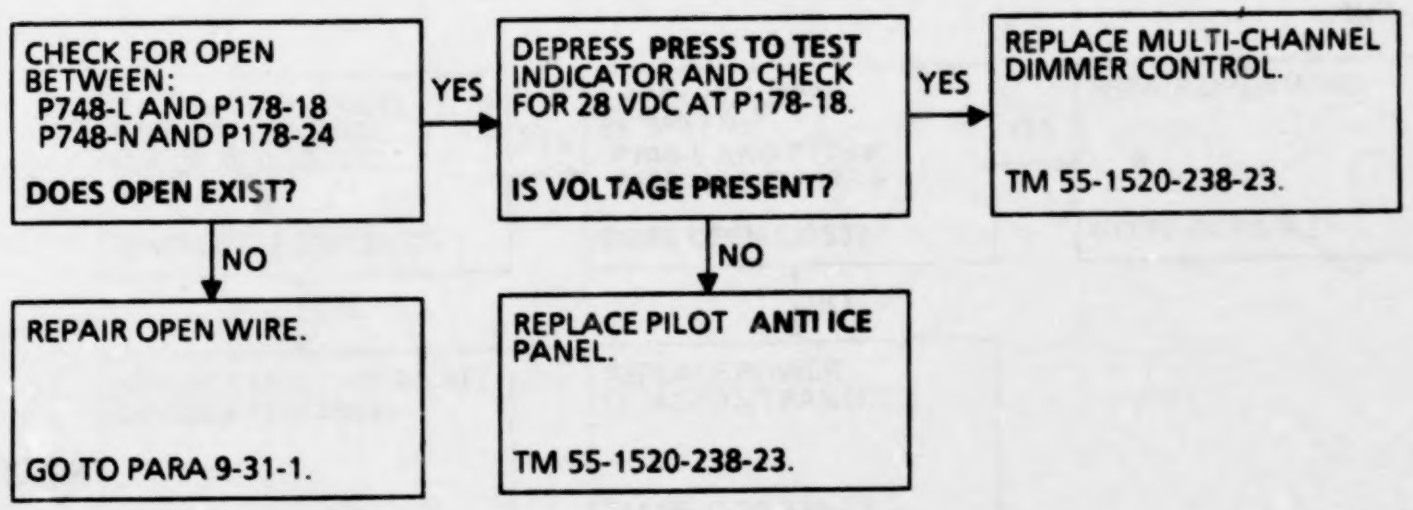
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ENG 1 INDICATOR
ENG 2 INDICATOR
ANTI ICE
BLADE
ON
ENG INLET
ENG 1
ENG 2
WSHLD WIPER
OFF
PARK
LOW
HIGH
TRACE
LT
AUTO
MOD
ON
OFF
TADS/ PNVS
PITOT AD SNSR
HTR
DEFOG
ON
OFF
TEST
GND
ON
ON
ON
ON
CANOPY

PILOT ANTI ICE PANEL

MM04/1-1164A


CHECK FOR OPEN BETWEEN: P748-L AND P178-18 P748-N AND P178-24
DOES OPEN EXIST?
YES
DEPRESS PRESS TO TEST INDICATOR AND CHECK FOR 28 VDC AT P178-18.
IS VOLTAGE PRESENT?
YES
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
NO
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE PILOT ANTI ICE PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-18. ENGINE 2 INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-15)

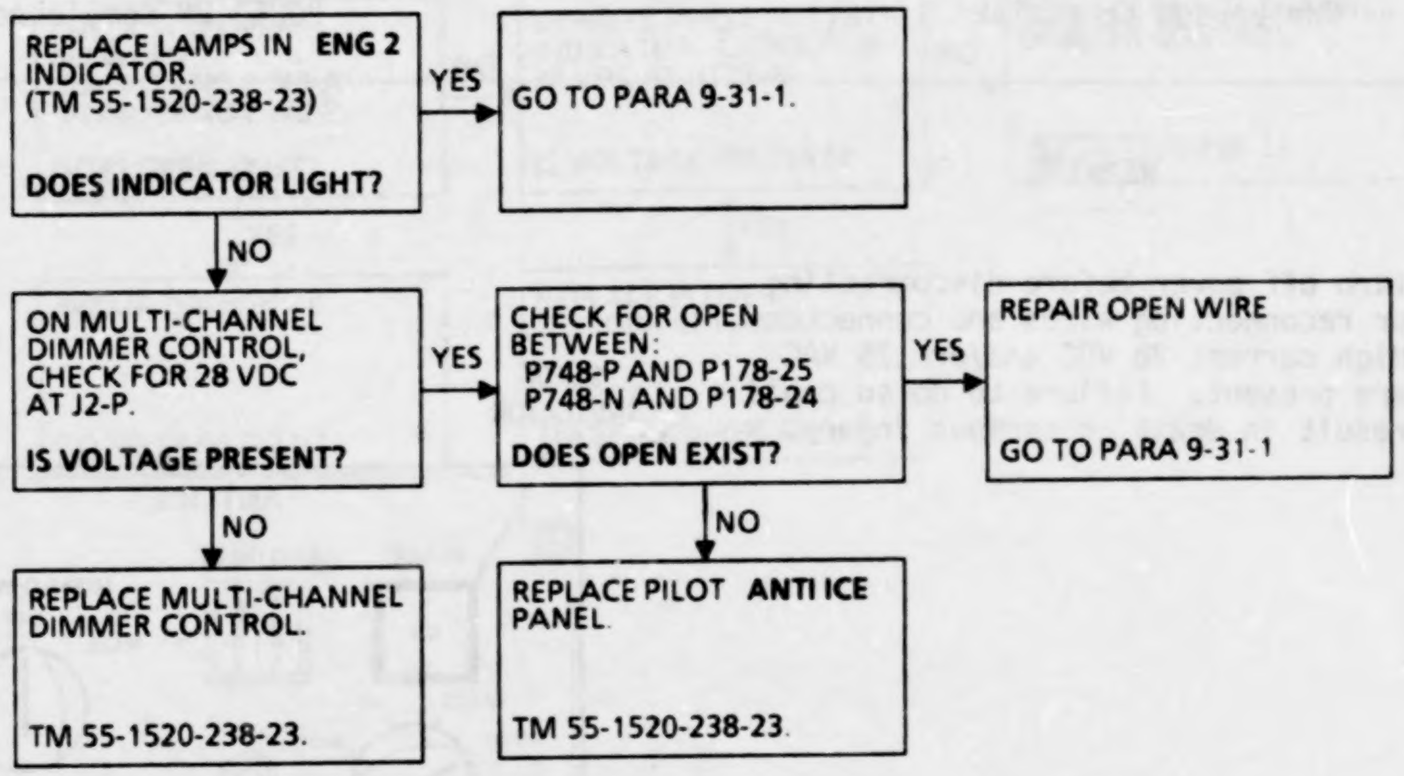
Personnel Required: (para 9-31-15)

References: (para 9-31-15)

Equipment Conditions: (para 9-31-17)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


REPLACE LAMPS IN ENG 2 INDICATOR. (TM 55-1520-238-23)
DOES INDICATOR LIGHT?
YES
GO TO PARA 9-31-1.
NO
ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-P.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P748-P AND P178-25 P748-N AND P178-24
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-31-1
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
NO
REPLACE PILOT ANTI ICE PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-19. BLADE INDICATOR IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

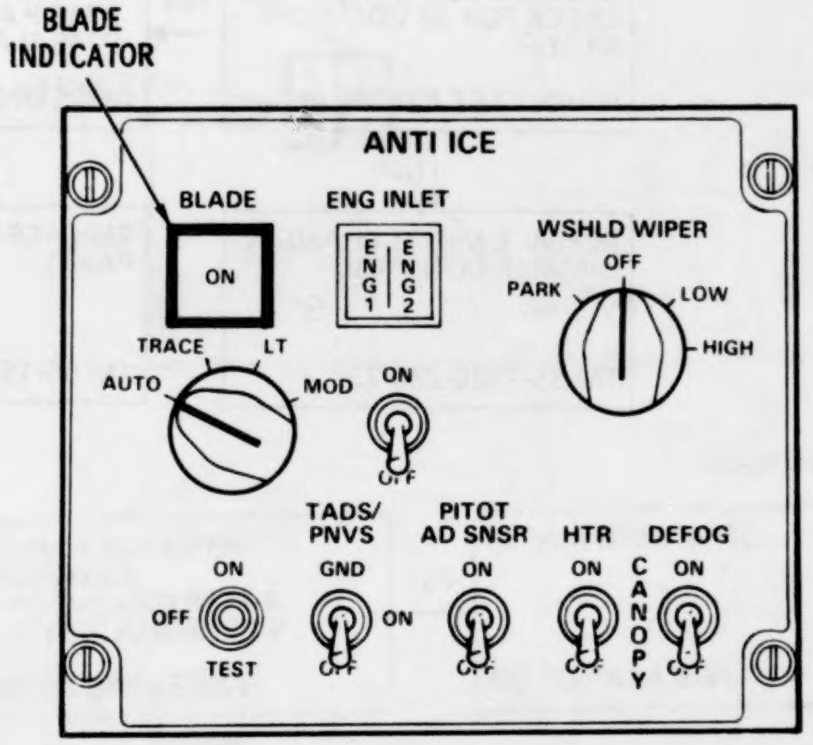
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

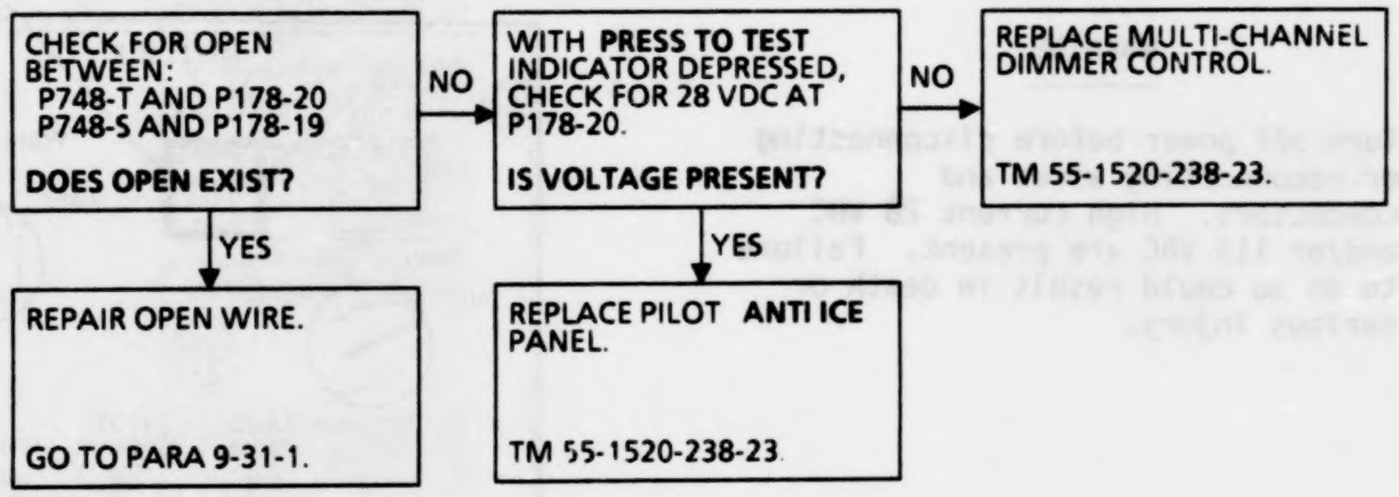
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


BLADE INDICATOR
ANTI ICE
BLADE
ON
ENG INLET
ENG 1
ENG 2
WSHLD WIPER
OFF
PARK
LOW
HIGH
TRACE
LT
AUTO
MOD
ON
OFF
TADS/ PNVS
PITOT AD SNSR
HTR
DEFOG
ON
GND
ON
ON
ON
OFF
ON
TEST
CANOPY

PILOT ANTI ICE PANEL

MM04/1-1165A



CHECK FOR OPEN BETWEEN:
P748-T AND P178-20
P748-S AND P178-19
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-31-1.

NO: WITH PRESS TO TEST INDICATOR DEPRESSED, CHECK FOR 28 VDC AT P178-20.
IS VOLTAGE PRESENT?

YES: REPLACE PILOT ANTI ICE PANEL. TM 55-1520-238-23.

NO: REPLACE MULTI-CHANNEL DIMMER CONTROL. TM 55-1520-238-23.

END OF TASK

9-31-20. ENG 1 INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-19)

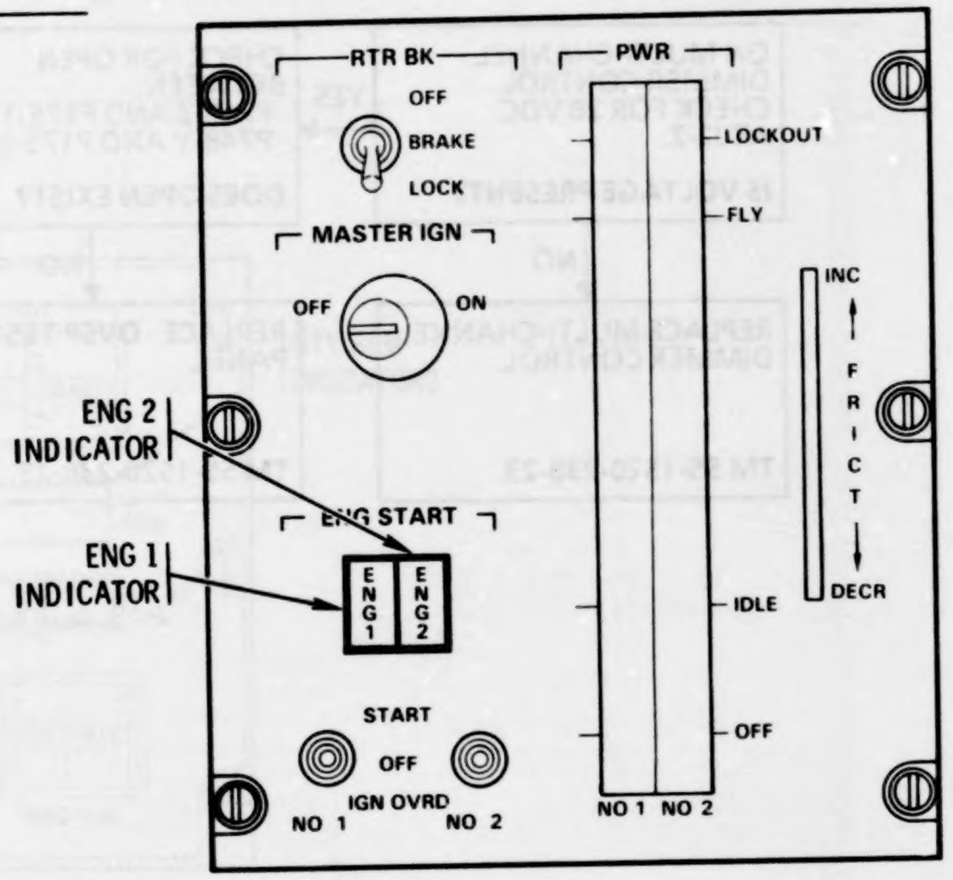
Personnel Required: (para 9-31-19)

References: (para 9-31-19)

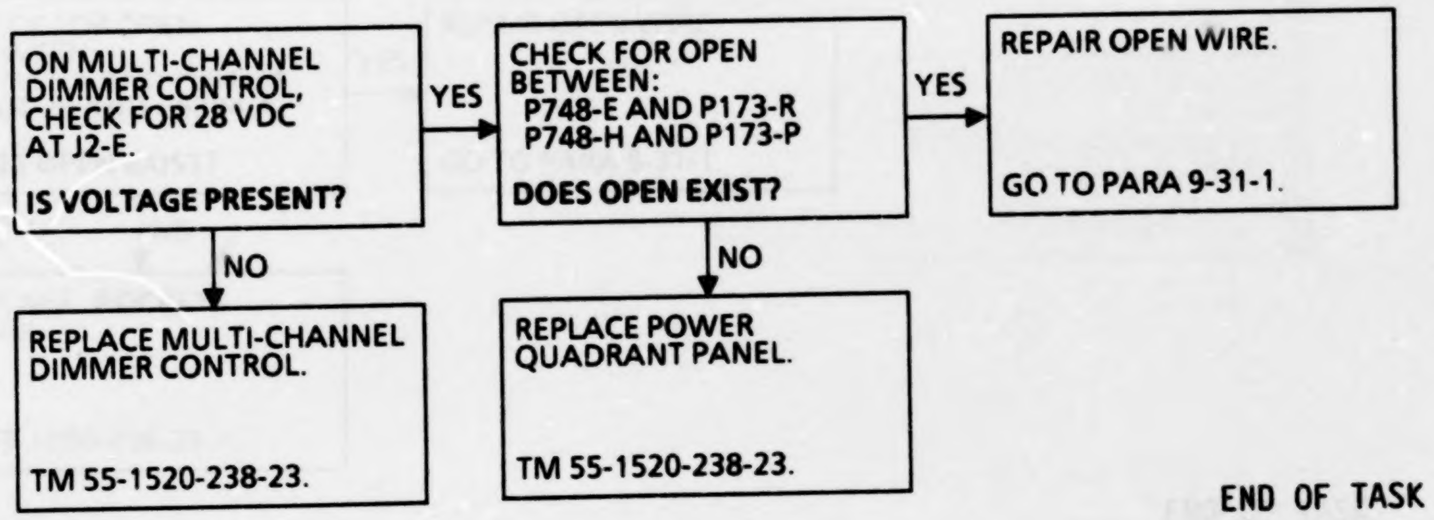
Equipment Conditions: (para 9-31-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


RTR BK
PWR
OFF
BRAKE
LOCK
LOCKOUT
FLY
MASTER IGN
OFF
ON
INC
F R I C T
DECR
ENG 2 INDICATOR
ENG START
ENG 1 INDICATOR
ENG 1
ENG 2
IDLE
START
OFF
IGN OVRD
NO 1
NO 2
OFF
NO 1
NO 2

MM04/1-1166A


ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-E.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P748-E AND P173-R
P748-H AND P173-P
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
NO
REPLACE POWER QUADRANT PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-21. ENG 2 INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-19)

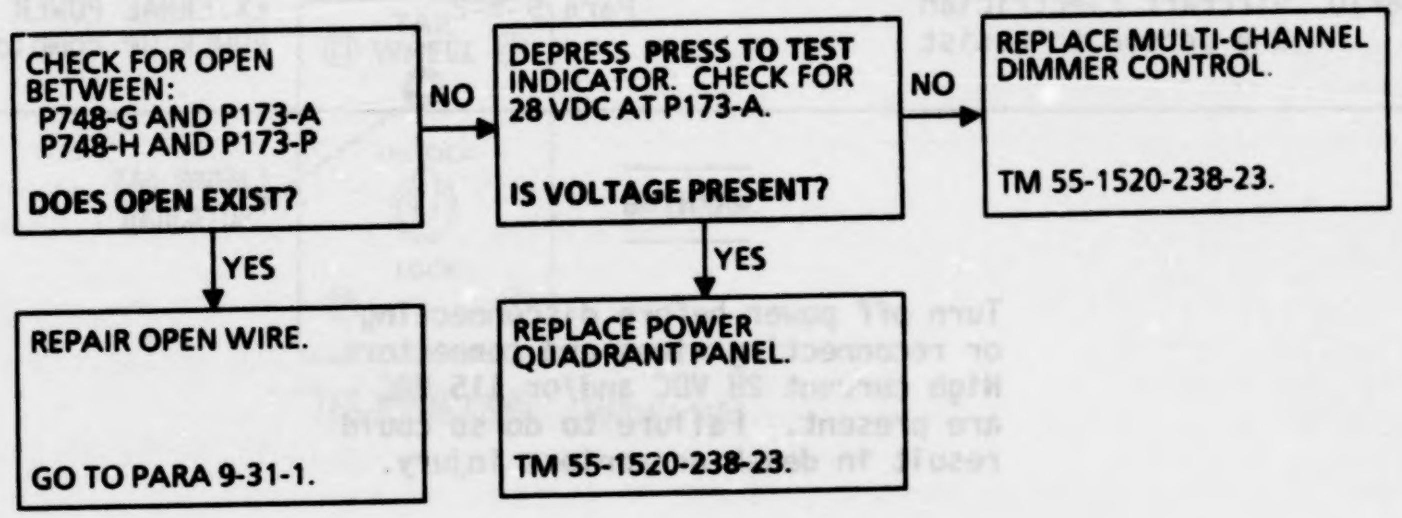
Personnel Required: (para 9-31-19)

References: (Para 9-31-19)

Equipment Conditions: (para 9-31-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR OPEN BETWEEN:
P748-G AND P173-A
P748-H AND P173-P
DOES OPEN EXIST?
NO
DEPRESS PRESS TO TEST INDICATOR. CHECK FOR 28 VDC AT P173-A.
IS VOLTAGE PRESENT?
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
YES
REPLACE POWER QUADRANT PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-22. EMERG PWR INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

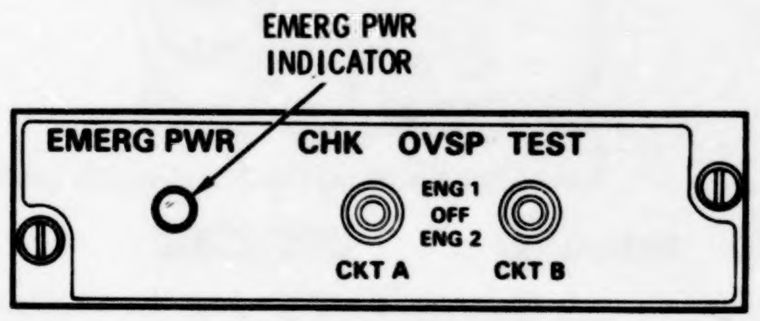
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

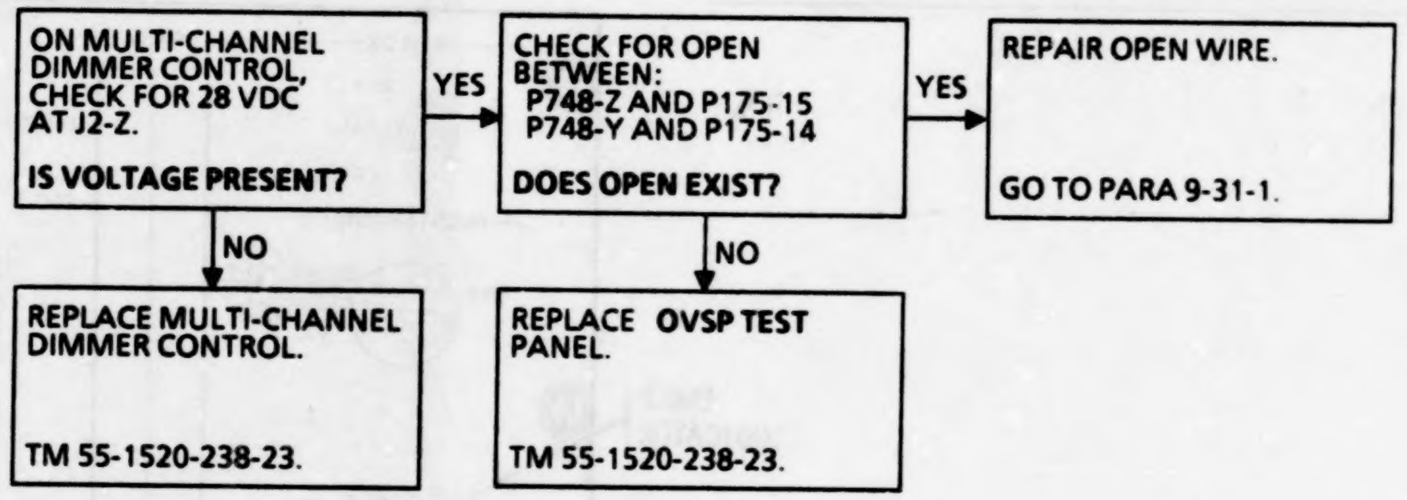
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



OVSP TEST PANEL

MM04/1-1167A



ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-Z.
IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P748-Z AND P175-15
P748-Y AND P175-14
DOES OPEN EXIST?

REPAIR OPEN WIRE.
GO TO PARA 9-31-1.

REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.

REPLACE OVSP TEST PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-23. ROCKET PANEL INDICATORS - ARE NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-22)

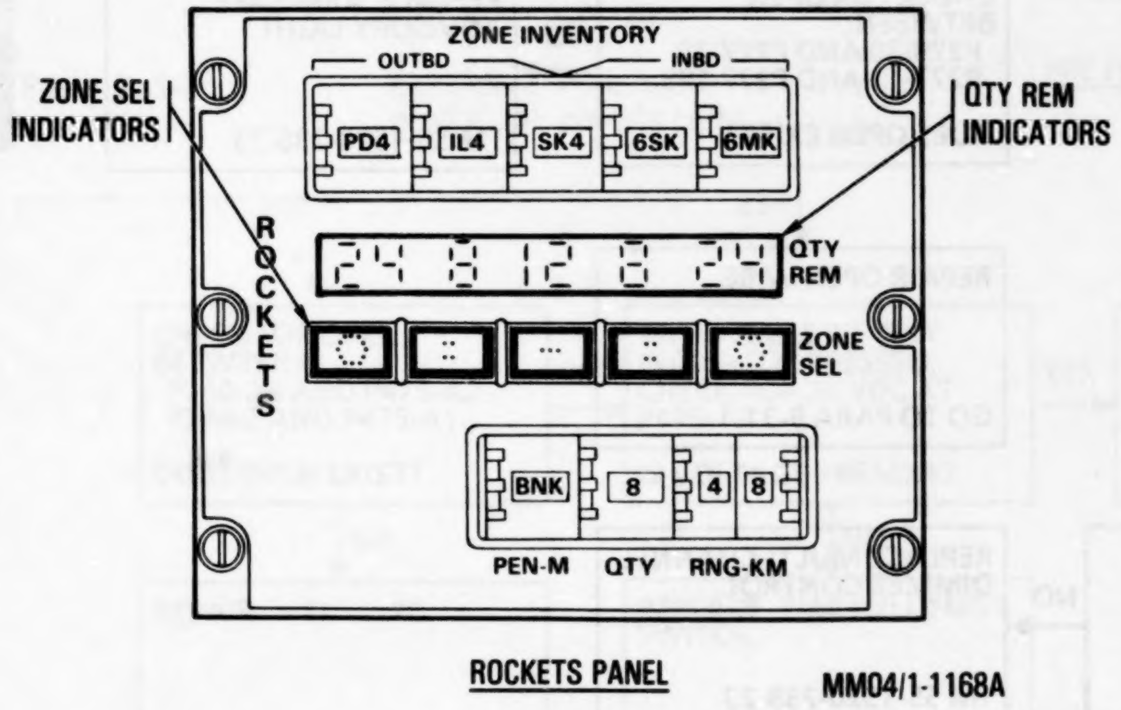
Personnel Required: (para 9-31-22)

References:

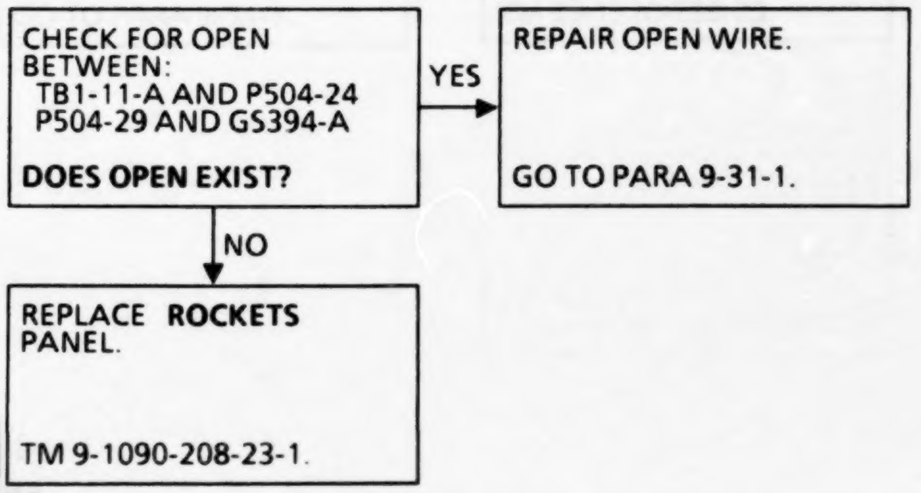
TM 55-1520-238-23
TM 9-1090-208-23-1

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Non-transparent barrier removed


ZONE INVENTORY
OUTBD
INBD
ZONE SEL INDICATORS
PD4
IL4
SK4
6SK
6MK
QTY REM INDICATORS
ROCKETS
24 8 12 8 24
QTY REM
ZONE SEL
BNK
8
4
8
PEN-M
QTY
RNG-KM

ROCKETS PANEL MM04/1-1168A



CHECK FOR OPEN BETWEEN:
TB1-11-A AND P504-24
P504-29 AND GS394-A

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

NO: REPLACE ROCKETS PANEL.

TM 9-1090-208-23-1.

END OF TASK

9-31-24. TAIL WHEEL INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-22)

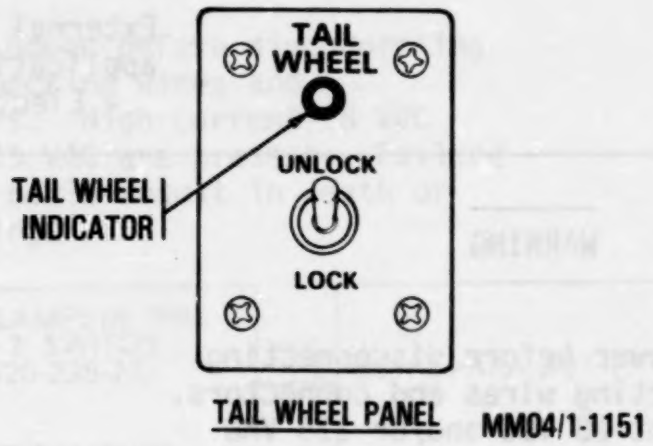
Personnel Required: (para 9-31-22)

References: (para 9-31-22)

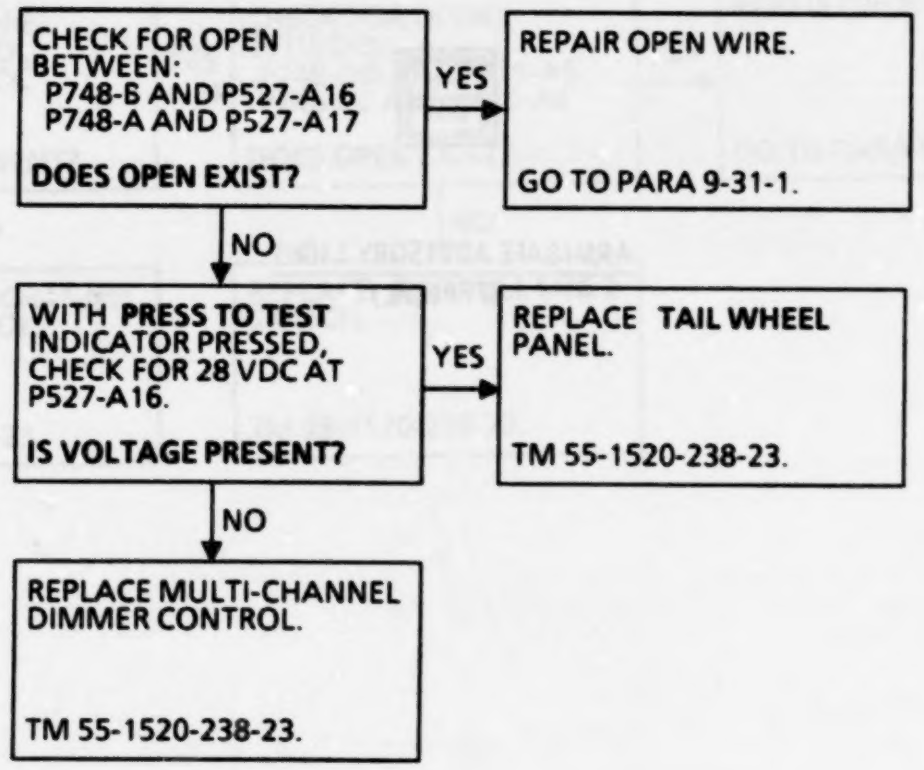
Equipment Conditions: (para 9-31-22)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


TAIL WHEEL
UNLOCK
LOCK
TAIL WHEEL INDICATOR

TAIL WHEEL PANEL MM04/1-1151



CHECK FOR OPEN BETWEEN:
P748-B AND P527-A16
P748-A AND P527-A17

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

NO: WITH PRESS TO TEST INDICATOR PRESSED, CHECK FOR 28 VDC AT P527-A16.

IS VOLTAGE PRESENT?

YES: REPLACE TAIL WHEEL PANEL.

TM 55-1520-238-23.

NO: REPLACE MULTI-CHANNEL DIMMER CONTROL.

TM 55-1520-238-23.

END OF TASK

9-31-25. ARM/SAFE INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23
TM 9-1230-476-20-1

Equipment Conditions:

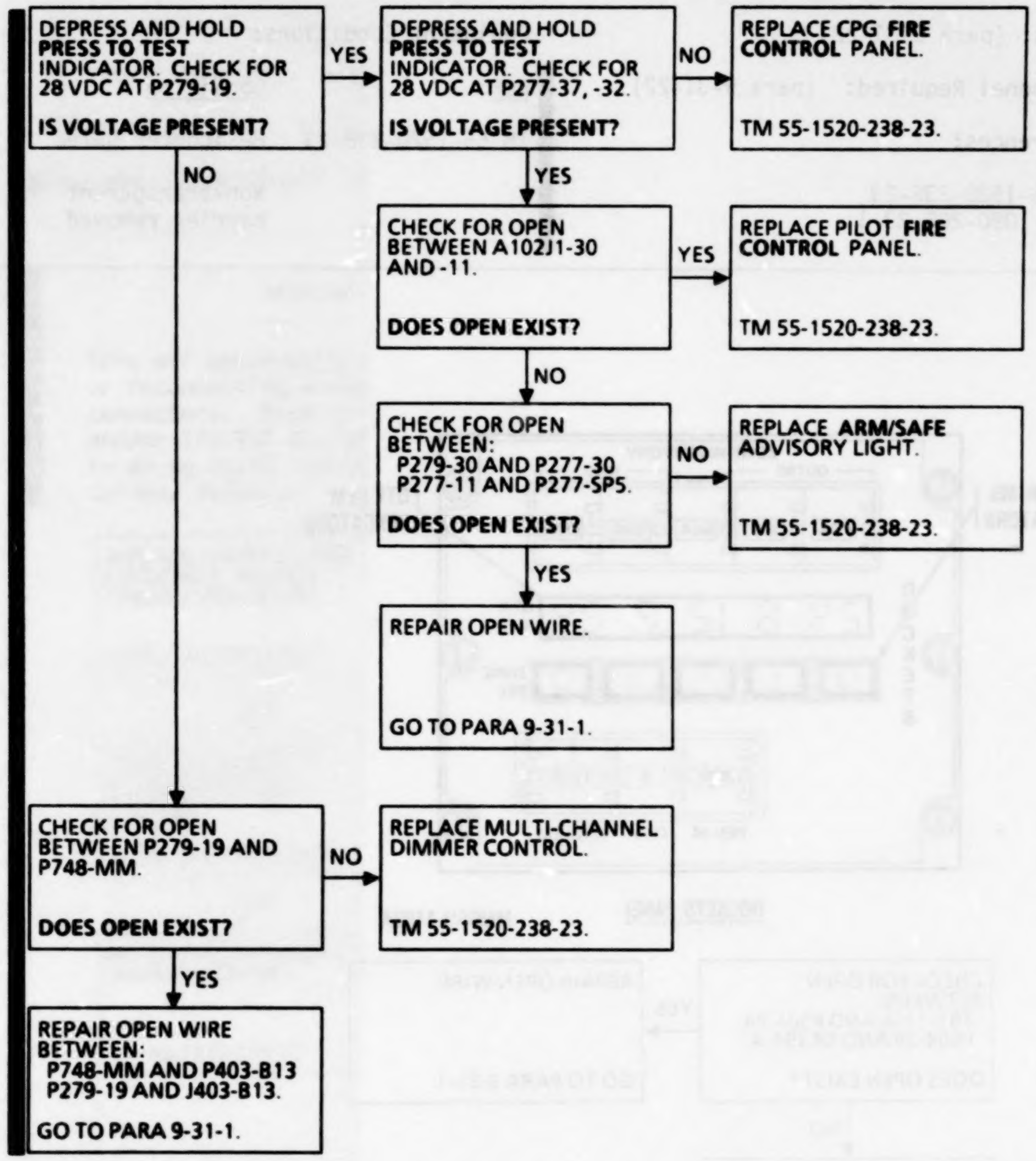
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

ARM/SAFE ADVISORY LIGHT (TYPICAL)

MM04/1-1169


DEPRESS AND HOLD PRESS TO TEST INDICATOR. CHECK FOR 28 VDC AT P279-19. IS VOLTAGE PRESENT?
YES
DEPRESS AND HOLD PRESS TO TEST INDICATOR. CHECK FOR 28 VDC AT P277-37, -32. IS VOLTAGE PRESENT?
NO
REPLACE CPG FIRE CONTROL PANEL. TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN A102J1-30 AND -11. DOES OPEN EXIST?
YES
REPLACE PILOT FIRE CONTROL PANEL. TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN: P279-30 AND P277-30 P277-11 AND P277-SP5. DOES OPEN EXIST?
NO
REPLACE ARM/SAFE ADVISORY LIGHT. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-31-1.
NO
CHECK FOR OPEN BETWEEN P279-19 AND P748-MM. DOES OPEN EXIST?
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE BETWEEN: P748-MM AND P403-B13 P279-19 AND J403-B13. GO TO PARA 9-31-1.

END OF TASK

9-31-26. FIRE PULL ENG 1 SWITCH - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-25)

Personnel Required: (para 9-31-25)

References:

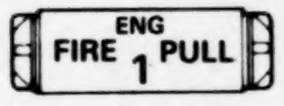
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

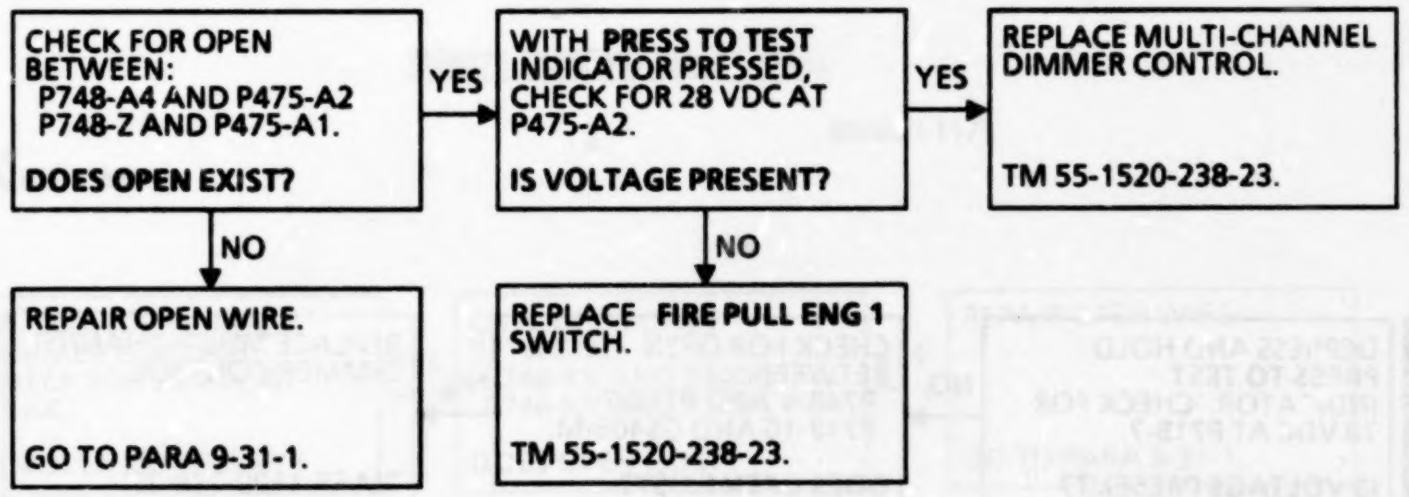
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


FIRE
ENG
1
PULL

FIRE PULL ENG 1 SWITCH

MM04/1-1170


CHECK FOR OPEN BETWEEN: P748-A4 AND P475-A2 P748-Z AND P475-A1.
DOES OPEN EXIST?
YES
WITH PRESS TO TEST INDICATOR PRESSED, CHECK FOR 28 VDC AT P475-A2.
IS VOLTAGE PRESENT?
YES
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
NO
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE FIRE PULL ENG 1 SWITCH.
TM 55-1520-238-23.

END OF TASK

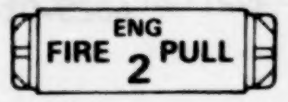
9-31-27. FIRE PULL ENG 2 SWITCH - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-25)

Personnel Required: (para 9-31-25)

References: (para 9-31-26)

Equipment Conditions: (para 9-31-26)

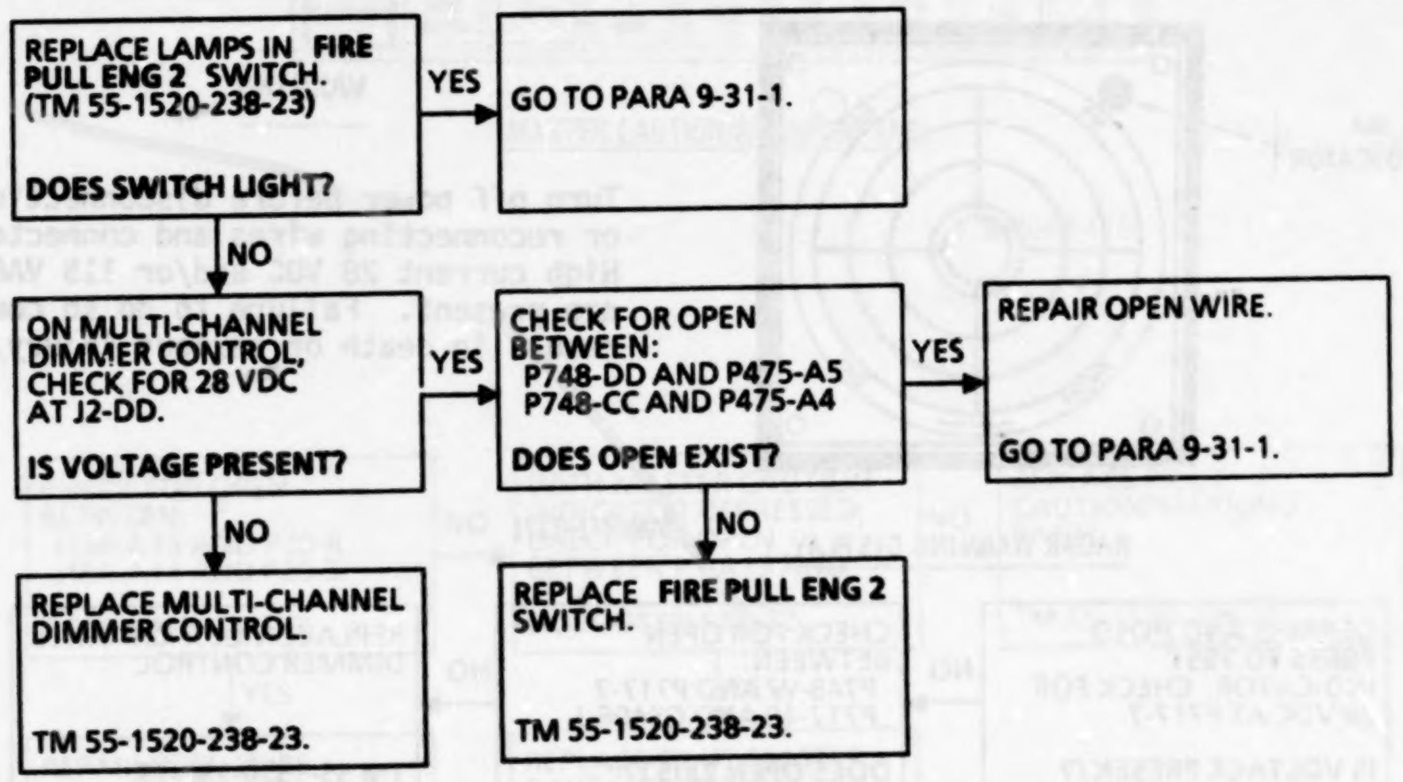

FIRE
ENG
2
PULL

FIRE PULL ENG 2 SWITCH

MM04/1-1152

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


REPLACE LAMPS IN FIRE PULL ENG 2 SWITCH. (TM 55-1520-238-23)
DOES SWITCH LIGHT?
YES
GO TO PARA 9-31-1.
NO
ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-DD.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P748-DD AND P475-A5 P748-CC AND P475-A4
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE FIRE PULL ENG 2 SWITCH.
TM 55-1520-238-23.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.

END OF TASK

9-31-28. MA INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

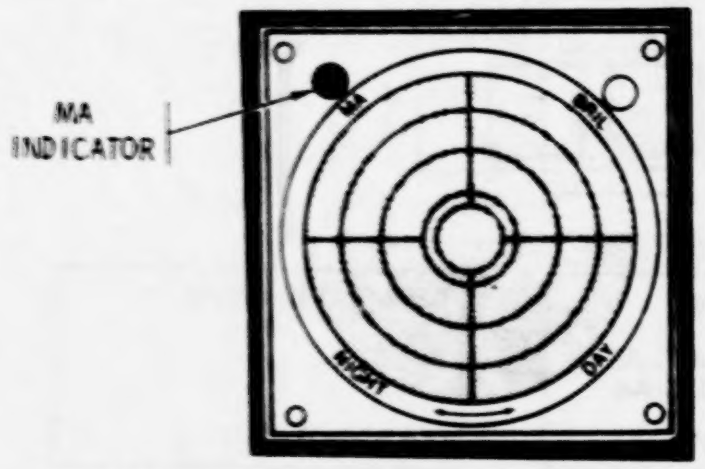
68F10 Aircraft Electrician (2)
One to assist

References:

TM 55-1520-238-23
TM 11-1520-238-23-1

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
	External power application - Electrical

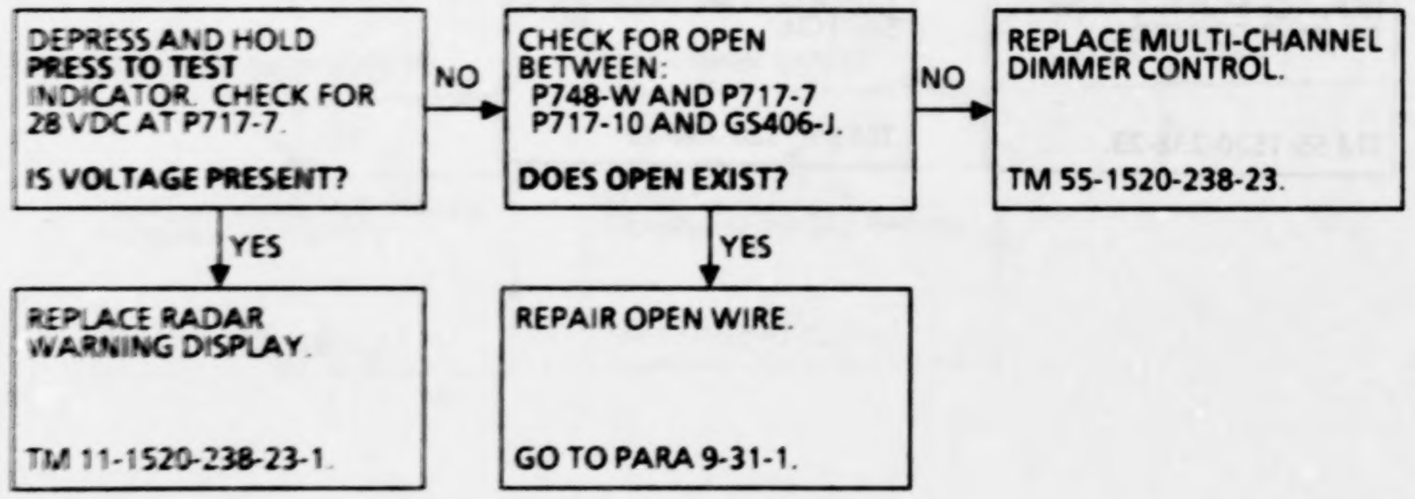


RADAR WARNING DISPLAY

MM04/1-1171

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



DEPRESS AND HOLD PRESS TO TEST INDICATOR. CHECK FOR 28 VDC AT P717-7.
IS VOLTAGE PRESENT?

YES: REPLACE RADAR WARNING DISPLAY. TM 11-1520-238-23-1.

NO: CHECK FOR OPEN BETWEEN: P748-W AND P717-7 P717-10 AND GS406-J.
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-31-1.

NO: REPLACE MULTI-CHANNEL DIMMER CONTROL. TM 55-1520-238-23.

END OF TASK

9-31-29. RADAR WARNING CONTROL PANEL SELF TEST INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-28)

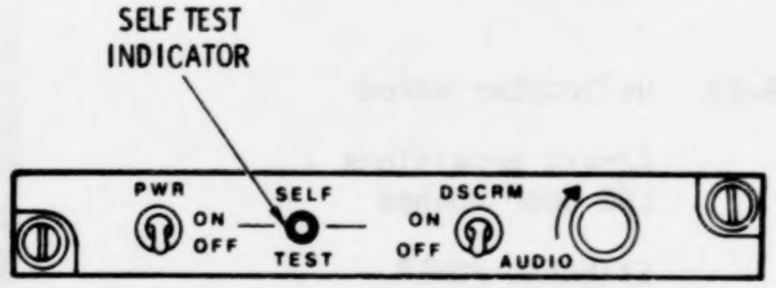
Personnel Required: (para 9-31-28)

References: (para 9-31-28)

Equipment Conditions: (para 9-31-28)

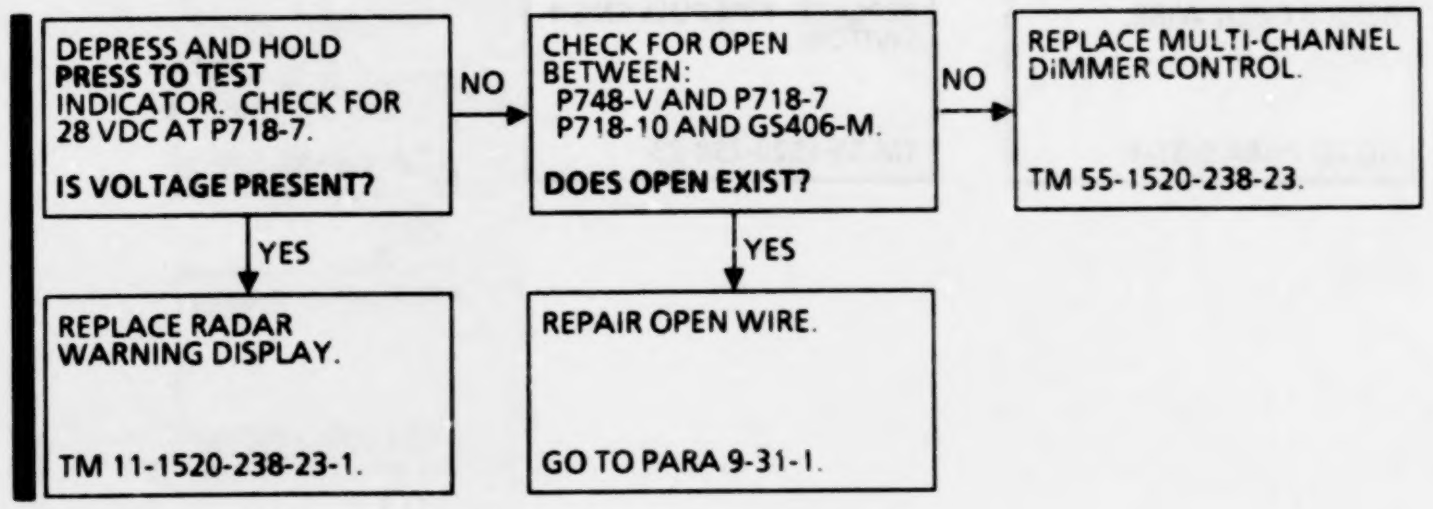
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



RADAR WARNING CONTROL PANEL

MM04/1-1153A



DEPRESS AND HOLD PRESS TO TEST INDICATOR. CHECK FOR 28 VDC AT P718-7.
IS VOLTAGE PRESENT?

YES: REPLACE RADAR WARNING DISPLAY. TM 11-1520-238-23-1.

NO: CHECK FOR OPEN BETWEEN: P748-V AND P718-7 P718-10 AND GS406-M.
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-31-1.

NO: REPLACE MULTI-CHANNEL DIMMER CONTROL. TM 55-1520-238-23.

END OF TASK

9-31-30. REMOTE TRANSMIT SELECT INDICATOR(S) - ARE NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-28)

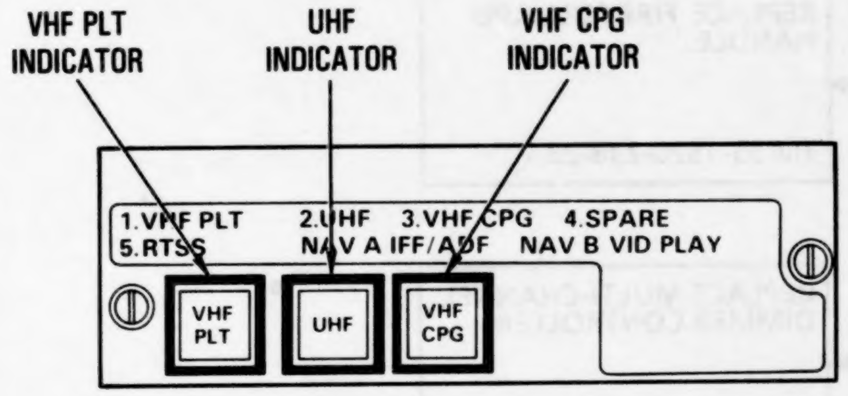
Personnel Required: (para 9-31-28)

References: (para 9-31-28)

Equipment Conditions: (para 9-31-29)

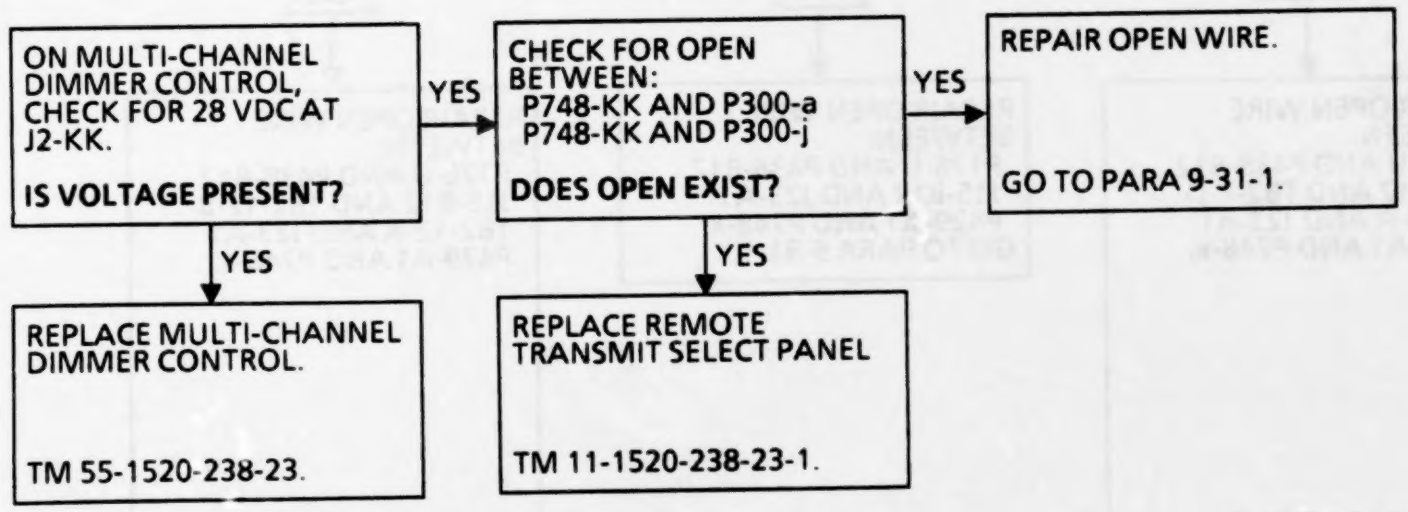
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


VHF PLT INDICATOR
UHF INDICATOR
VHF CPG INDICATOR
1.VHF PLT
2.UHF
3.VHF CPG
4.SPARE
5.RTS
NAV A
IFF/ADF
NAV B
VID PLAY
VHF PLT
UHF
VHF CPG

REMOTE TRANSMIT SELECT PANEL

MM04/1-1172


YES
YES
YES
YES

ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-KK.
IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P748-KK AND P300-a
P748-KK AND P300-j
DOES OPEN EXIST?

REPAIR OPEN WIRE.
GO TO PARA 9-31-1.

REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.

REPLACE REMOTE TRANSMIT SELECT PANEL
TM 11-1520-238-23-1.

END OF TASK

9-31-31. MASTER CAUTION INDICATOR - DOES NOT RESET CAUTION INDICATORS

Tools: (para 9-31-28)

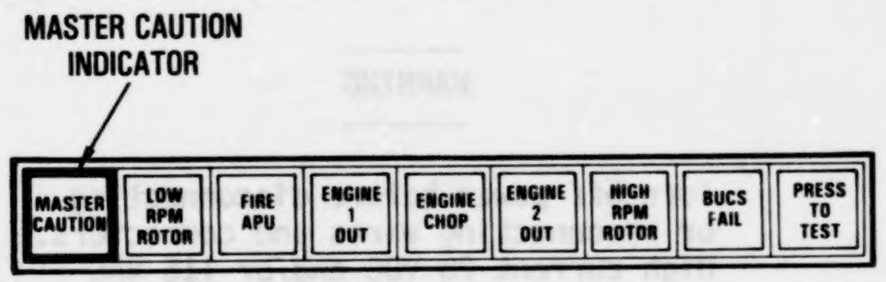
Personnel Required: (para 9-31-28)

References:

TM 55-1520-238-23

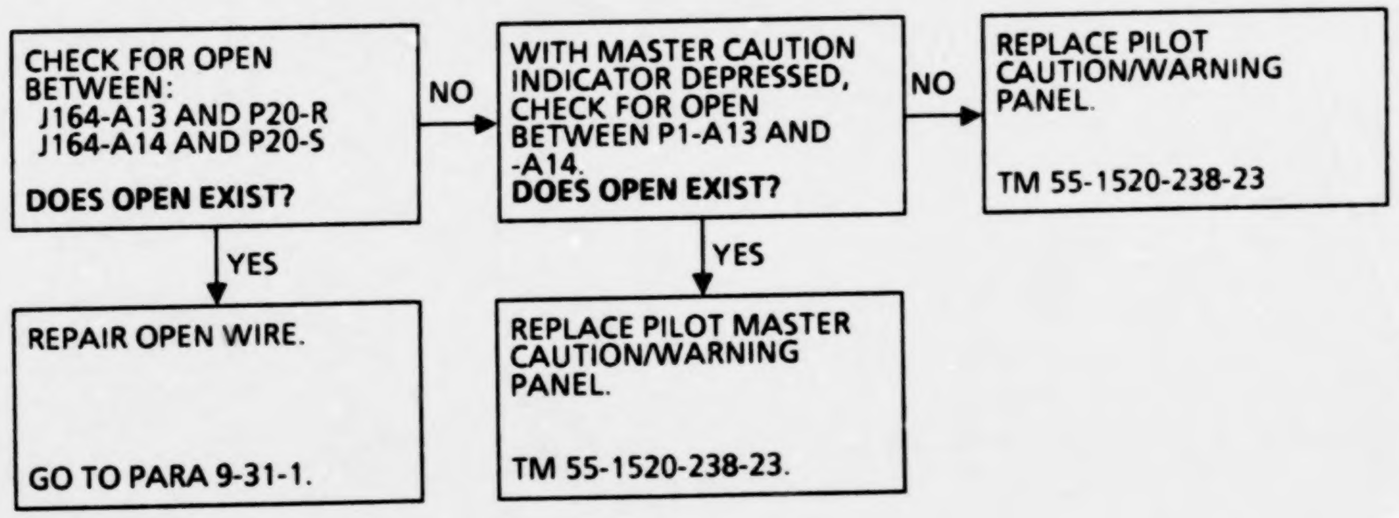
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


MASTER CAUTION INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

MASTER CAUTION/WARNING PANEL

MM04/1-1154


NO
NO
YES
YES

CHECK FOR OPEN BETWEEN:
J164-A13 AND P20-R
J164-A14 AND P20-S
DOES OPEN EXIST?

WITH MASTER CAUTION INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN P1-A13 AND -A14.
DOES OPEN EXIST?

REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23

REPAIR OPEN WIRE.
GO TO PARA 9-31-1.

REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-32. APU FIRE PULL HANDLE - DOES NOT LIGHT WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

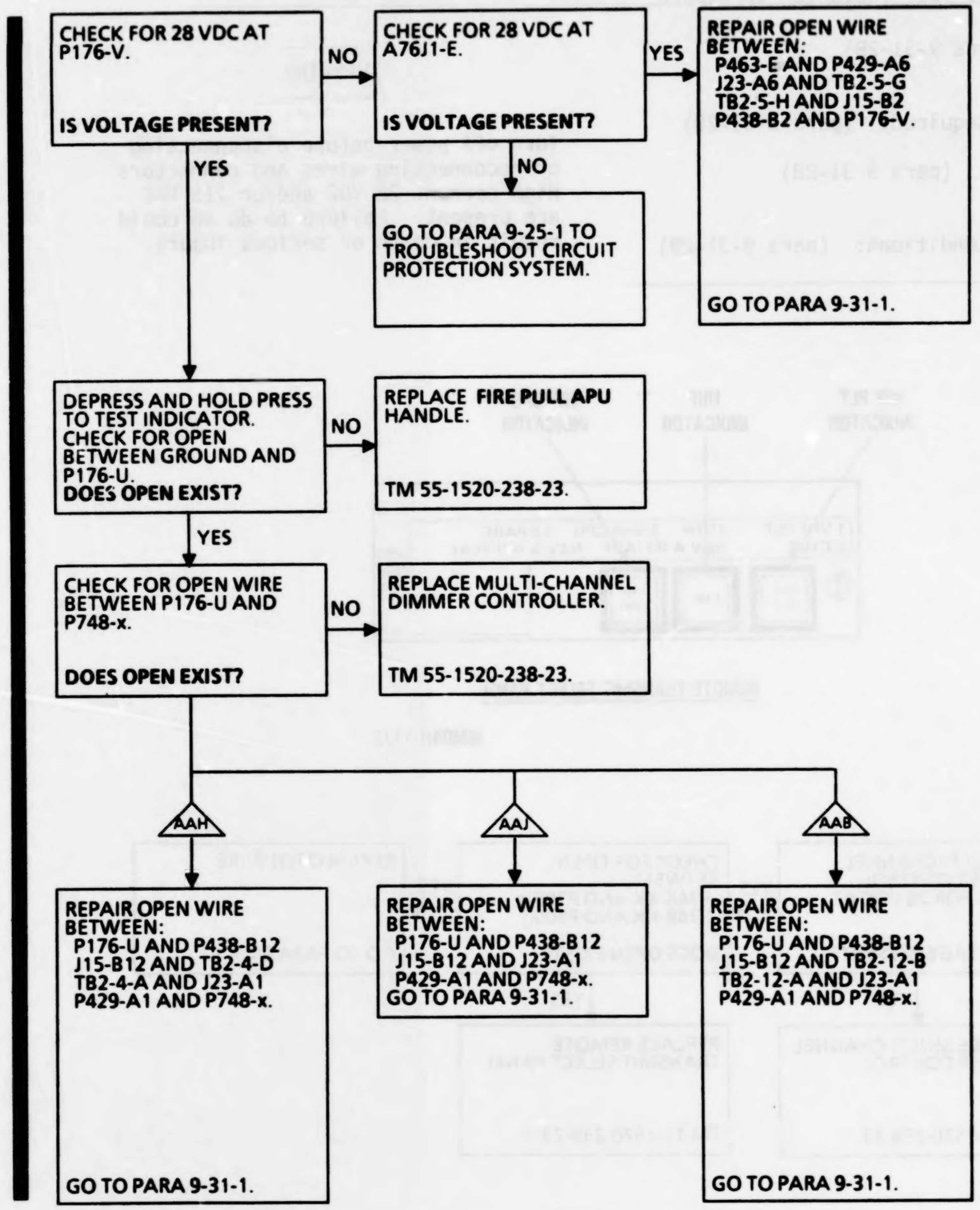
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 28 VDC AT P176-V. IS VOLTAGE PRESENT?

CHECK FOR 28 VDC AT A76J1-E. IS VOLTAGE PRESENT?

REPAIR OPEN WIRE BETWEEN: P463-E AND P429-A6 J23-A6 AND TB2-5-G TB2-5-H AND J15-B2 P438-B2 AND P176-V. GO TO PARA 9-31-1.

GO TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

DEPRESS AND HOLD PRESS TO TEST INDICATOR. CHECK FOR OPEN BETWEEN GROUND AND P176-U. DOES OPEN EXIST?

REPLACE FIRE PULL APU HANDLE. TM 55-1520-238-23.

CHECK FOR OPEN WIRE BETWEEN P176-U AND P748-x. DOES OPEN EXIST?

REPLACE MULTI-CHANNEL DIMMER CONTROLLER. TM 55-1520-238-23.

REPAIR OPEN WIRE BETWEEN: P176-U AND P438-B12 J15-B12 AND TB2-4-D TB2-4-A AND J23-A1 P429-A1 AND P748-x. GO TO PARA 9-31-1.

REPAIR OPEN WIRE BETWEEN: P176-U AND P438-B12 J15-B12 AND J23-A1 P429-A1 AND P748-x. GO TO PARA 9-31-1.

REPAIR OPEN WIRE BETWEEN: P176-U AND P438-B12 J15-B12 AND TB2-12-B TB2-12-A AND J23-A1 P429-A1 AND P748-x. GO TO PARA 9-31-1.

END OF TASK

9-32-1. CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

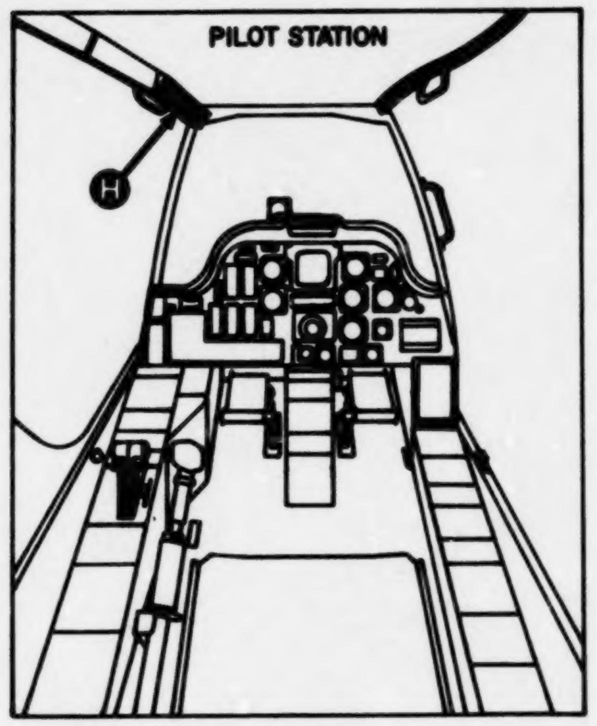
68F10 Aircraft Electrician

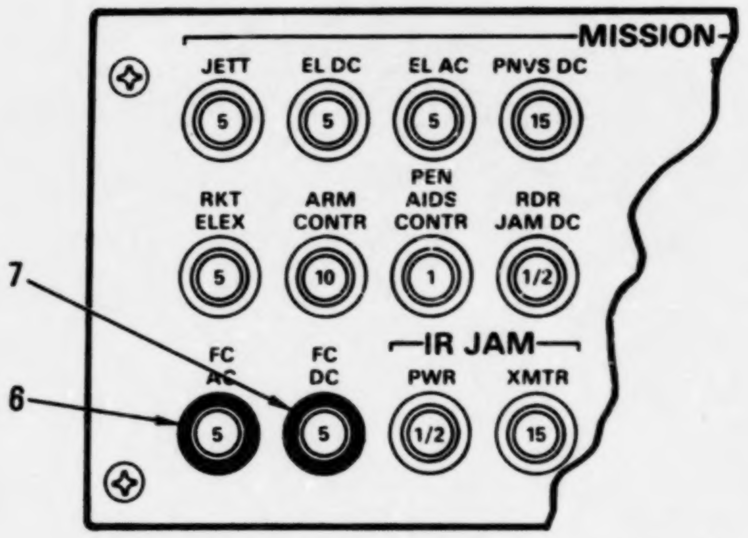
References:

TM 55-1520-238-23
TM 9-1230-476-20-2

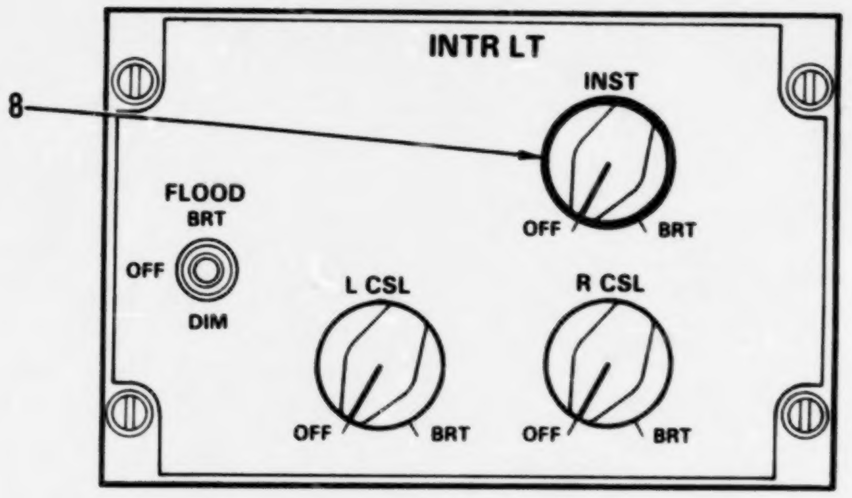
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-14-1	CPG EDGE-LIGHT OPERATIONAL CHECK completed

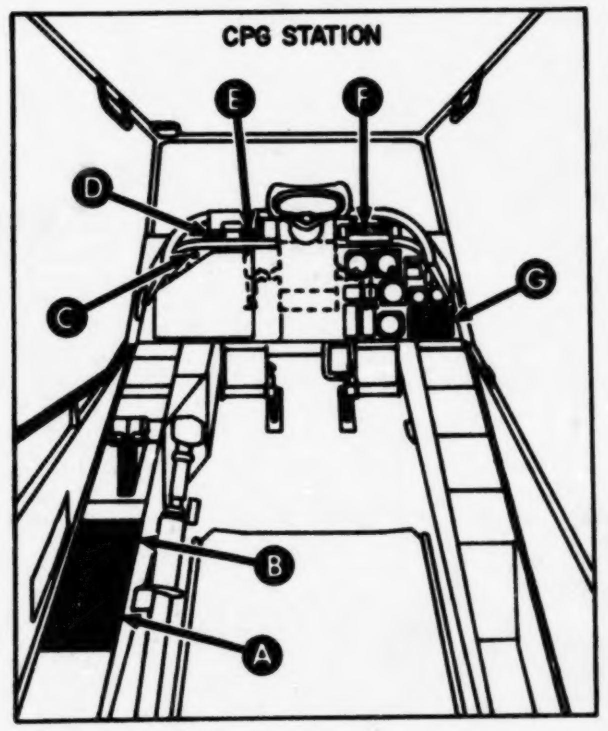

PILOT STATION
H

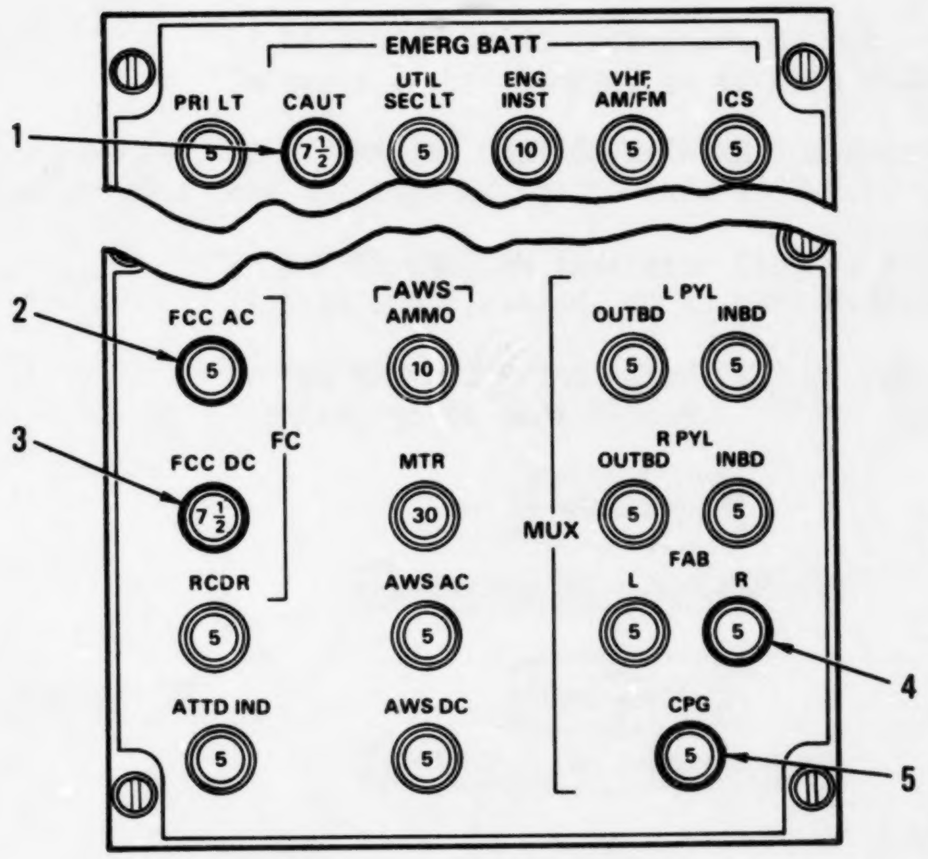

MISSION
JETT
EL DC
EL AC
PNVS DC
5
5
5
15
RKT ELEX
ARM CONTR
PEN AIDS CONTR
RDR JAM DC
5
10
1
1/2
FC AC
FC DC
IR JAM
PWR
XMTR
5
5
1/2
15
7
6

H PILOT FORWARD CIRCUIT BREAKER PANEL

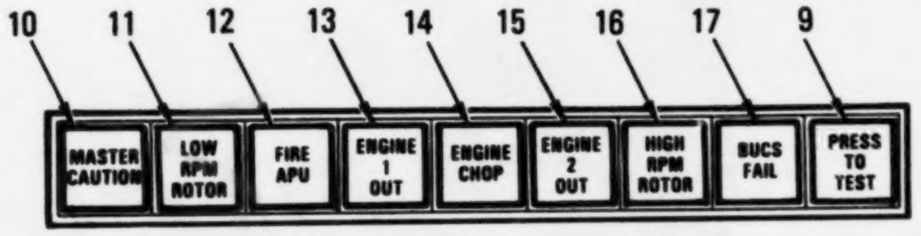

INTR LT
INST
8
OFF
BRT
FLOOD
BRT
OFF
DIM
L CSL
OFF
BRT
R CSL
OFF
BRT

B CPG INTR LT PANEL

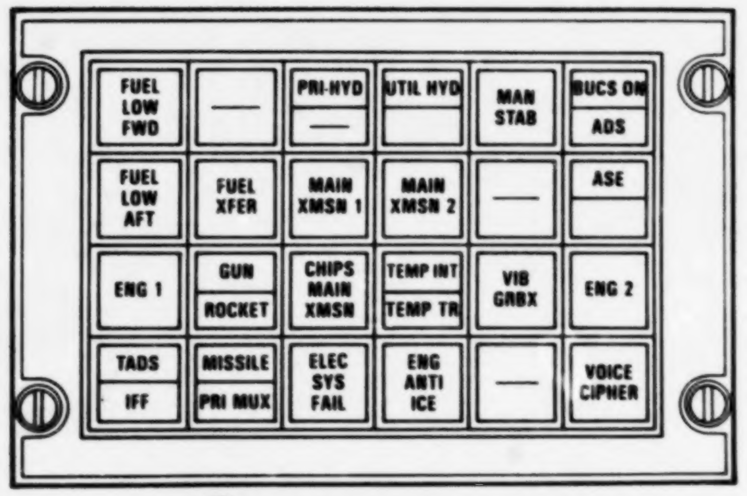

CPG STATION
E
F
D
C
G
B
A


EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5
1
2
FCC AC
5
AWS
AMMO
10
L PYL
OUTBD
INBD
5
5
3
FCC DC
7½
FC
MTR
30
MUX
R PYL
OUTBD
INBD
5
5
FAB
L
R
5
5
RCDR
5
AWS AC
5
4
ATTD IND
5
AWS DC
5
CPG
5
5

A CPG CIRCUIT BREAKER PANEL NO. 1


10
11
12
13
14
15
16
17
9
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

F CPG MASTER CAUTION/WARNING BREAKER


FUEL LOW FWD
PRI-HYD
UTIL HYD
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
FUEL XFER
MAIN XMSN 1
MAIN XMSN 2
ASE
ENG 1
GUN
ROCKET
CHIPS MAIN XMSN
TEMP INT
TEMP TR
VIB GRBX
ENG 2
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
VOICE CIPHER

G CPG CAUTION/WARNING PANEL

MM04/1-1031-1E

GO TO NEXT PAGE

9-32-1. CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On CPG circuit breaker panel No. 1, check that **EMERG BATT CAUT** (1), **FC FCC AC** (2), **FC FCC DC** (3), **MUX FAB R** (4), and **MUX CPG** (5) circuit breakers are closed.	If **EMERG BATT CAUT** circuit breaker (1) does not stay closed, go to para 9-32-4 If **FC FCC AC** (2), **FC FCC DC** (3), **MUX FAB R** (4) and **MUX CPG** (5) circuit breaker(s) do not stay closed, refer to TM 9-1230-476-20-2 to troubleshoot fire control system.
2. On pilot forward circuit breaker panel, check that **MISSION FC AC** (6), and **MISSION FC DC** (7) circuit breaker are closed.	If **MISSION FC AC** (6), and **MISSION FC DC** (7) circuit breaker(s) do not stay closed, refer to TM 9-1230-476-20-2 to troubleshoot fire control system.
3. On CPG **INTR LT** panel, turn **INST** control (8) to **BRT**.	If **PRESS TO TEST** (9) is not lighted, go to para 9-32-5. If edge-light panel is not lighted, go to para 9-32-30.
4. Turn **INST** control (8) to **OFF**.	If **CAUTION/WARNING** indicators do not increase in brightness, go to para 9-32-3.
5. On CPG master caution/warning panel, depress **PRESS TO TEST** indicator (9).	If all **MASTER CAUTION/WARNING** indicators are not lighted, go to para 9-32-6. If **MASTER CAUTION** indicator (10) is not lighted and flashing, go to para 9-32-7. If **LOW RPM ROTOR** indicator (11) is not lighted, go to para 9-32-8. If **FIRE APU** indicator (12) is not lighted, go to para 9-32-9. If **ENG 1 OUT** indicator (13) is not lighted, go to para 9-32-10. If **ENG CHOP** indicator (14) is not lighted, go to para 9-32-11. If **ENG 2 OUT** indicator (15) is not lighted, go to para 9-32-12. If **HIGH RPM ROTOR** indicator (16) is not lighted, go to para 9-32-13. If **BUCS FAIL** indicator (17) is not lighted, go to para 9-32-14.
7. On CPG cauton/warning panel, check that all indicators are lighted and flashing.	If all caution/warning indicators are not lighted and flashing, go to para 9-32-6. If some caution/warning indicators are not lighted and flashing, replace lamp(s) (TM 55-1520-238-23) and repeat step 6. If replaced lamp(s) are not lighted and flashing, replace cauton/warning panel (TM 55-1520-238-23).
8. On CPG instrument panel, check that **ARM/SAFE** (18), **FIRE PULL ENG 1** (19) and **FIRE PULL ENG 2** (20) indicators are lighted.	If all three indicators are not lighted, go to para 9-32-32. If **ARM/SAFE** indicator (18) is not lighted, go to para 9-32-15. If **FIRE PULL ENG 1** indicator (19) is not lighted, go to para 9-32-16. If **FIRE PULL ENG 2** indicator (20) is not lighted, go to para 9-32-17.

C ARM/SAFE INDICATOR (18)

ENG
FIRE 1 PULL

D FIRE PULL ENG 1 INDICATOR (19)

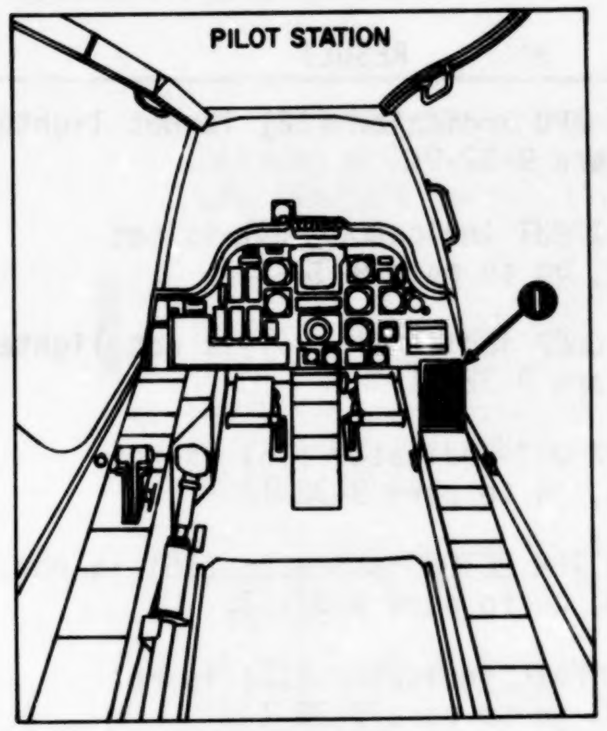
ENG
FIRE 2 PULL

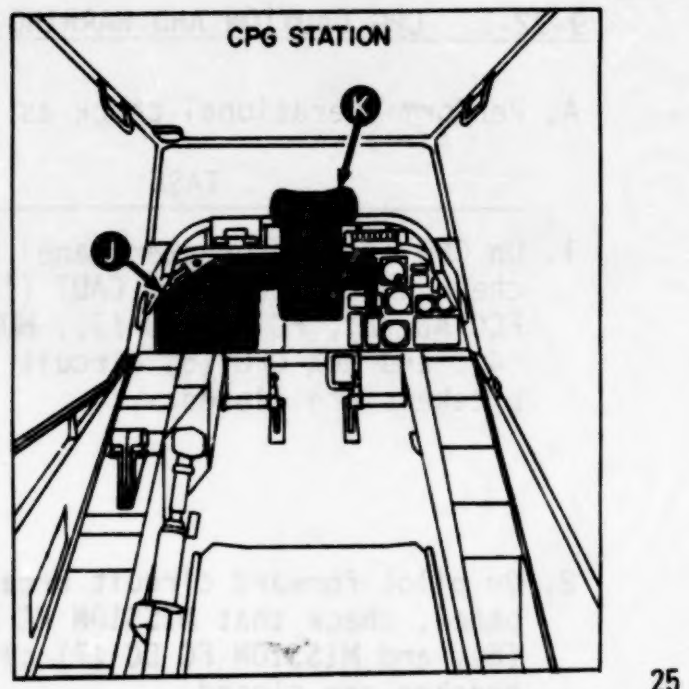
E FIRE PULL ENG 2 INDICATOR (20)

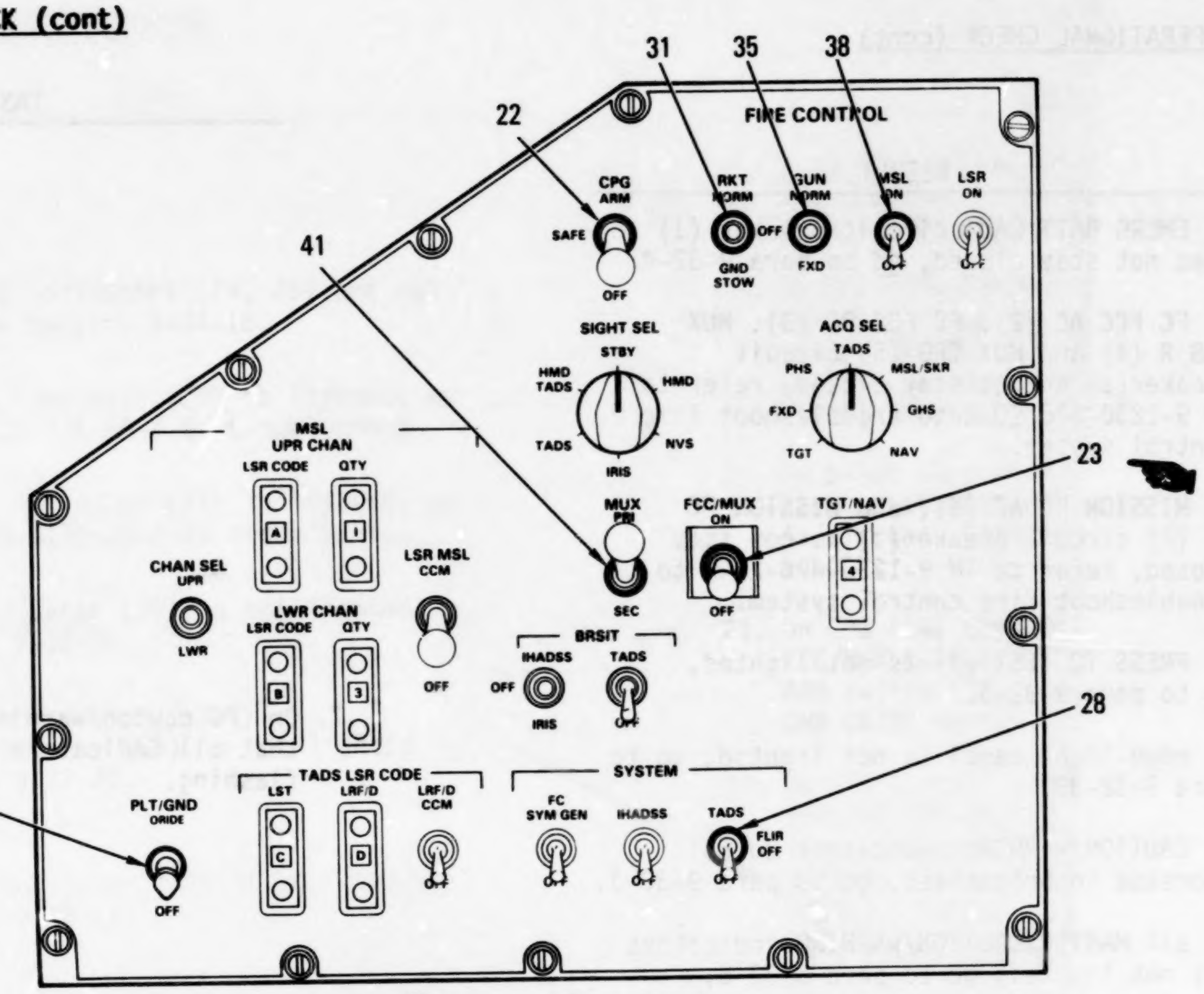
MM04/1-1031-2

GO TO NEXT PAGE

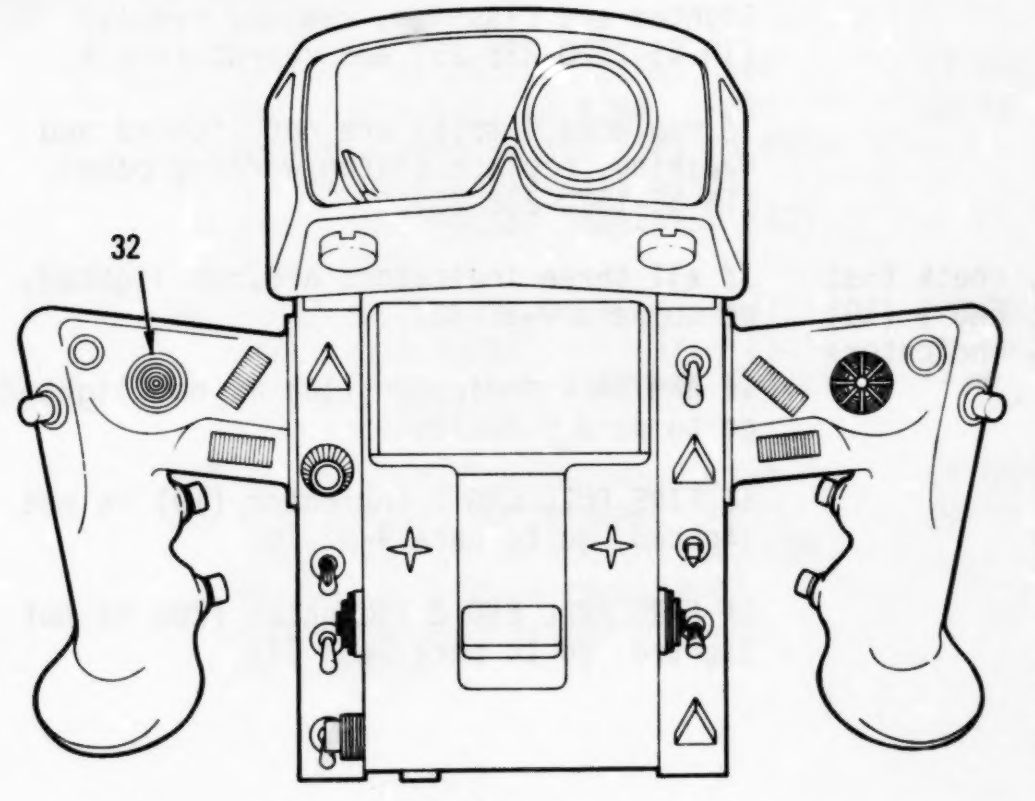
9-32-1. CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)


PILOT STATION
I

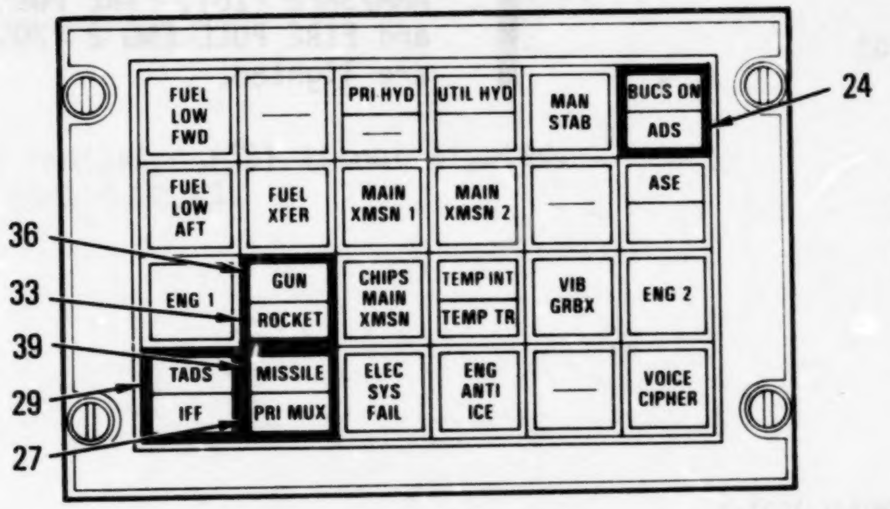

CPG STATION
K
J


22
31
35
38
41
23
21
28
FIRE CONTROL
CPG ARM
SAFE
OFF
RKT NORM
OFF
GUN NORM
FXD
GND STOW
MSL ON
LSR ON
SIGHT SEL
STBY
HMD TADS
HMD
TADS
NVS
IRIS
ACQ SEL
TADS
PHS
MSL/SKR
FXD
GHS
TGT
NAV
MSL UPR CHAN
LSR CODE
QTY
A
1
CHAN SEL
UPR
LWR
LWR CHAN
LSR CODE
QTY
B
3
LSR MSL CCM
OFF
MUX PRI
SEC
FCC/MUX ON
OFF
TGT/NAV
4
BRSIT
IHADSS
TADS
OFF
IRIS
OFF
PLT/GND ORIDE
OFF
TADS LSR CODE
LST
LRF/D
LRF/D CCM
C
D
SYSTEM
FC SYM GEN
IHADSS
TADS
FLIR OFF

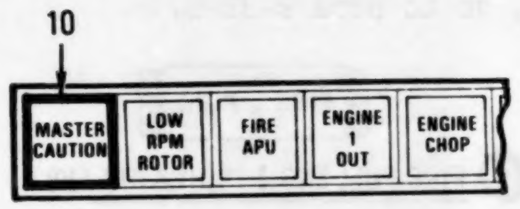
Ⓙ CPG FIRE CONTROL PANEL



Ⓚ CPG ORT

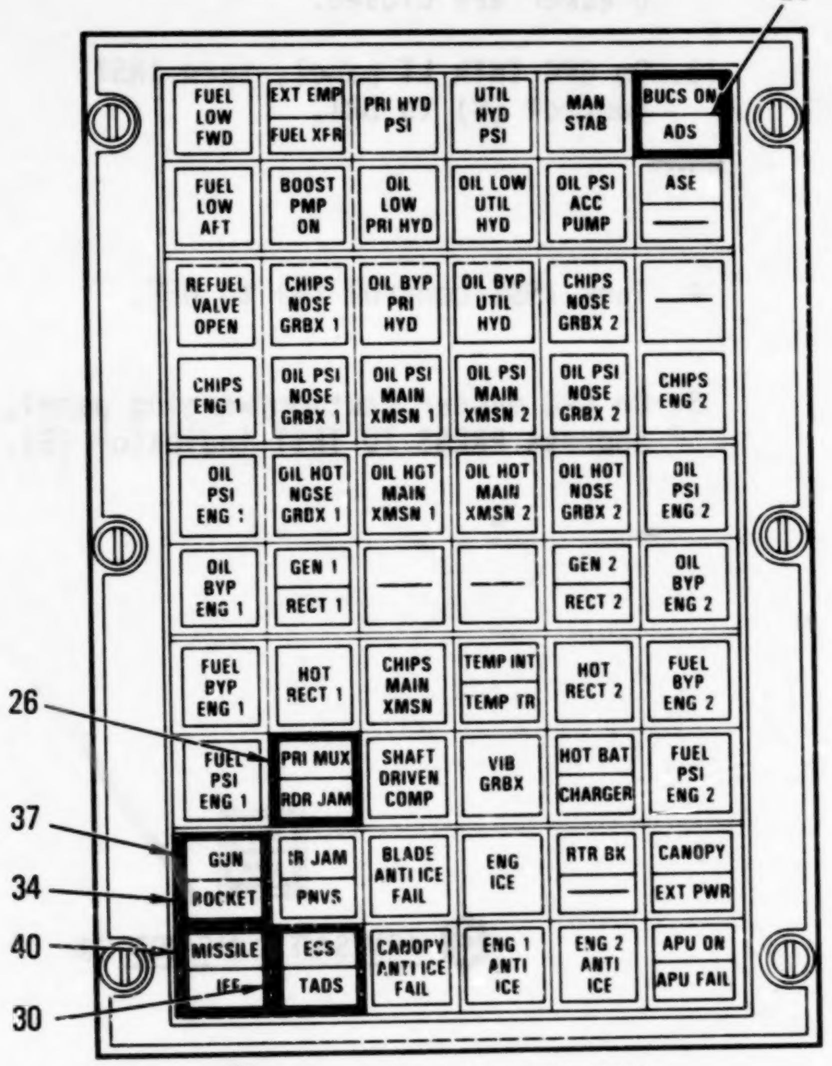

24
36
33
39
29
27
FUEL LOW FWD
—
PRI HYD
UTIL HYD
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
FUEL XFER
MAIN XMSN 1
MAIN XMSN 2
—
ASE
ENG 1
GUN
ROCKET
CHIPS MAIN XMSN
TEMP INT
TEMP TR
VIB GRBX
ENG 2
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
—
VOICE CIPHER

CPG CAUTION/WARNING PANEL


10
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP

CPG MASTER CAUTION/WARNING PANEL

MM04/1-1031-3C


25
26
37
34
40
30
FUEL LOW FWD
EXT EMP
FUEL XFR
PRI HYD PSI
UTIL HYD PSI
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
BOOST PMP ON
OIL LOW PRI HYD
OIL LOW UTIL HYD
OIL PSI ACC PUMP
ASE
REFUEL VALVE OPEN
CHIPS NOSE GRBX 1
OIL BYP PRI HYD
OIL BYP UTIL HYD
CHIPS NOSE GRBX 2
—
CHIPS ENG 1
OIL PSI NOSE GRBX 1
OIL PSI MAIN XMSN 1
OIL PSI MAIN XMSN 2
OIL PSI NOSE GRBX 2
CHIPS ENG 2
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
—
—
GEN 2
RECT 2
OIL BYP ENG 2
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
—
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

Ⓘ PILOT CAUTION/WARNING PANEL

GO TO NEXT PAGE

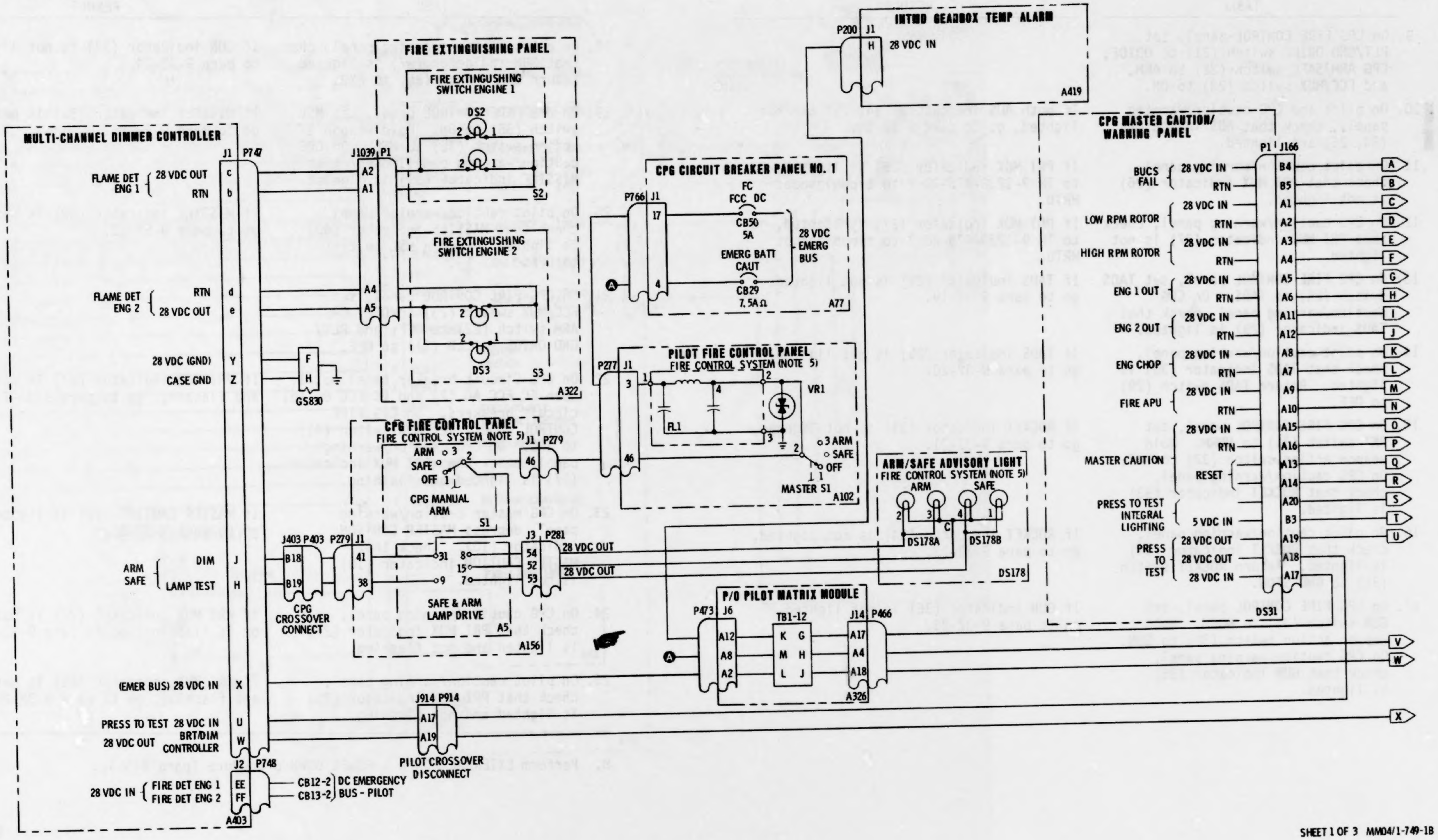
9-32-1. CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)

TASK	RESULT
9. On CPG **FIRE CONTROL** panel, set **PLT/GND ORIDE** switch (21) to **ORIDE**, **CPG ARM/SAFE** switch (22) to **ARM**, and **FCC/MUX** switch (23) to **ON**.	
10. On pilot and CPG caution/warning panels, check that **ADS** indicators (24, 25) are lighted.	If both **ADS** indicators (24, 25) are not lighted, go to para 9-32-18.
11. On pilot caution/warning panel, check that **PRI MUX** indicator (26) is not lighted.	If **PRI MUX** indicator (26) is lighted, go to TM 9-1230-476-20-2 to troubleshoot MRTU.
12. On CPG caution/warning panel, check that **PRI MUX** indicator (27) is not lighted.	If **PRI MUX** indicator (27) is lighted, go to TM 9-1230-476-20-2 to troubleshoot MRTU.
13. On CPG **FIRE CONTROL** panel, set **TADS** switch (28) to **TADS**. On **CPG** caution/warning panel, check that **TADS** indicator (29) is lighted.	If **TADS** indicator (29) is not lighted, go to para 9-32-19.
14. On pilot caution/warning panel, check that **TADS** indicator (30) is lighted. Return **TADS** switch (28) to **OFF**.	If **TADS** indicator (29) is not lighted, go to para 9-32-20.
15. On CPG **FIRE CONTROL** panel, set **RKT** switch (31) to **NORM**. Hold weapon action switch (32) to **RKT**. On CPG caution/warning panel, check that **ROCKET** indicator (33) is lighted.	If **ROCKET** indicator (33) is not lighted, go to para 9-32-21.
16. On pilot caution/warning panel, check that **ROCKET** indicator (34) is lighted. Return **ROCKET** switch (31) to **GND STOW**.	If **ROCKET** indicator (34) is not lighted, go to para 9-32-22.
17. On CPG **FIRE CONTROL** panel, set **GUN** switch (35) to **NORM**. Hold weapon action switch (32) to **GUN**. On **CPG** caution/warning panel, check that **GUN** indicator (36) is lighted.	If **GUN** indicator (36) is not lighted, go to para 9-32-23.
18. On pilot caution/warning panel, check that **GUN** indicator (37) is lighted. Return **GUN** switch (35) to **FXD**.	If **GUN** indicator (37) is not lighted, go to para 9-32-24.
19. On CPG **FIRE CONTROL** panel, set **MSL** switch (38) to **ON**. Hold weapon action switch (32) to **MSL**. On CPG caution/warning panel, check that **MISSILE** indicator (39) is lighted.	If **MISSILE** indicator (39) is not lighted, go to para 9-32-25.
20. On pilot caution/warning panel, check that **MISSILE** indicator (40) is lighted. Return **MSL** switch to **OFF**.	If **MISSILE** indicator (40) is not lighted, go to para 9-32-26.
21. On CPG **FIRE CONTROL** panel, set **FCC/MUX** switch (23) to **OFF**, CPG **ARM** switch (22) to **OFF**, and **PLT/GND ORIDE** switch (21) to **OFF**.	
22. On CPG Circuit breaker panel no. 1, open **FC FCC AC** (2) and **FC FCC DC** (3) circuit breakers. On CPG **FIRE CONTROL** panel, set **MUX** switch (41) to **SEC**. On CPG caution/warning panel, check that **PRI MUX** indicator (27) is lighted and flashing.	If **PRI MUX** indicator (27) is not lighted and flashing, go to para 9-32-27.
23. On CPG master caution/warning panel, depress **MASTER CAUTION** indicator (10). Check that **MASTER CAUTION** indicator (10) is not lighted.	If **MASTER CAUTION** (10) is lighted, go to para 9-32-28.
24. On CPG caution/warning panel, check that **PRI MUX** indicator (27) is lighted and not flashing.	If **PRI MUX** indicator (27) is not lighted, or is flashing, go to para 9-32-28.
25. On pilot caution/warning panel, check that **PRI MUX** indicator (26) is lighted and not flashing.	If **PRI MUX** indicator (26) is not lighted and flashing, go to para 9-32-29.

B. Perform EXTERNAL POWER - POWER DOWN procedure (para 9-5-3).

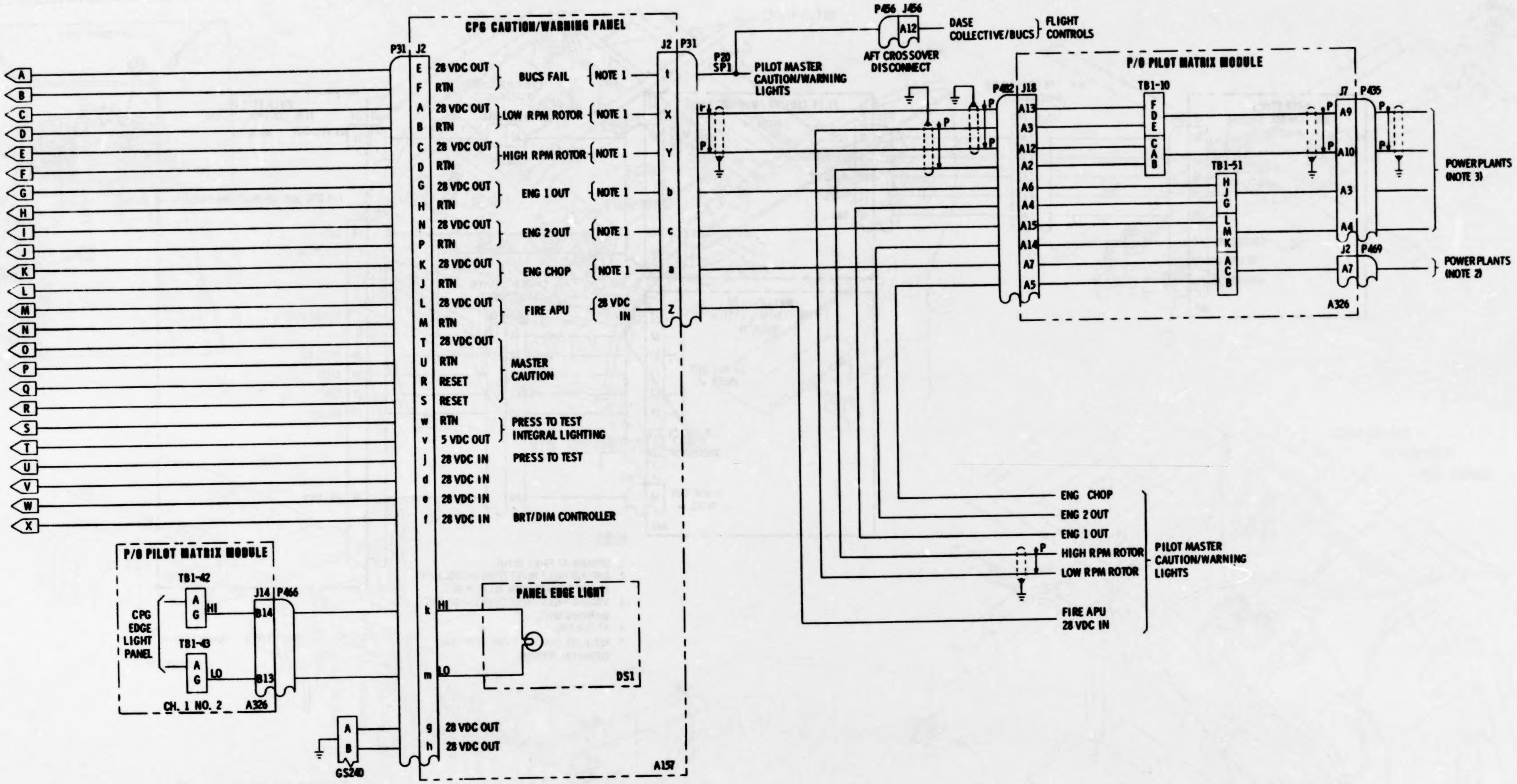
END OF TASK

9-32-2. CPG CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM


MULTI-CHANNEL DIMMER CONTROLLER
J1 P747
FLAME DET ENG 1
28 VDC OUT c
RTN b
FLAME DET ENG 2
RTN d
28 VDC OUT e
28 VDC (GND) Y
CASE GND Z
GS830
ARM SAFE
DIM J
LAMP TEST H
(EMER BUS) 28 VDC IN X
PRESS TO TEST 28 VDC IN U
28 VDC OUT BRT/DIM CONTROLLER W
J2 P748
28 VDC IN
FIRE DET ENG 1 EE
FIRE DET ENG 2 FF
A403
CB12-2 DC EMERGENCY
CB13-2 BUS - PILOT
FIRE EXTINGUISHING PANEL
FIRE EXTINGUSHING SWITCH ENGINE 1
DS2
S2
FIRE EXTINGUSHING SWITCH ENGINE 2
DS3
S3
J1039 P1
A2
A1
A4
A5
A322
CPG FIRE CONTROL PANEL
FIRE CONTROL SYSTEM (NOTE 5)
ARM
SAFE
OFF
CPG MANUAL ARM
S1
J1 P279
46
J403 P403
B18
B19
CPG CROSSOVER CONNECT
P279 J1
41
38
J3 P281
54
52
53
28 VDC OUT
28 VDC OUT
SAFE & ARM LAMP DRIVE
A5
A156
J914 P914
A17
A19
PILOT CROSSOVER DISCONNECT
CPG CIRCUIT BREAKER PANEL NO. 1
P766 J1
17
4
FC
FCC DC
CB50 5A
28 VDC EMERG BUS
EMERG BATT CAUT
CB29 7.5A
A77
PILOT FIRE CONTROL PANEL
FIRE CONTROL SYSTEM (NOTE 5)
P277 J1
3
46
FL1
VR1
ARM
SAFE
OFF
MASTER S1
A102
INTMD GEARBOX TEMP ALARM
P200 J1
H 28 VDC IN
A419
ARM/SAFE ADVISORY LIGHT
FIRE CONTROL SYSTEM (NOTE 5)
ARM
SAFE
DS178A
DS178B
DS178
P/O PILOT MATRIX MODULE
P473 J6
A12
A8
A2
TB1-12
K G
M H
L J
J14 P466
A17
A4
A18
A326
CPG MASTER CAUTION/ WARNING PANEL
P1 J166
BUCS FAIL
28 VDC IN B4
RTN B5
LOW RPM ROTOR
28 VDC IN A1
RTN A2
HIGH RPM ROTOR
28 VDC IN A3
RTN A4
ENG 1 OUT
28 VDC IN A5
RTN A6
ENG 2 OUT
28 VDC IN A11
RTN A12
ENG CHOP
28 VDC IN A8
RTN A7
FIRE APU
28 VDC IN A9
RTN A10
28 VDC IN A15
RTN A16
MASTER CAUTION
A13
RESET A14
PRESS TO TEST INTEGRAL LIGHTING
A20
5 VDC IN B3
PRESS TO TEST
28 VDC OUT A19
28 VDC OUT A18
28 VDC IN A17
DS31
A B C D E F G H I J K L M N O P Q R S T U V W X

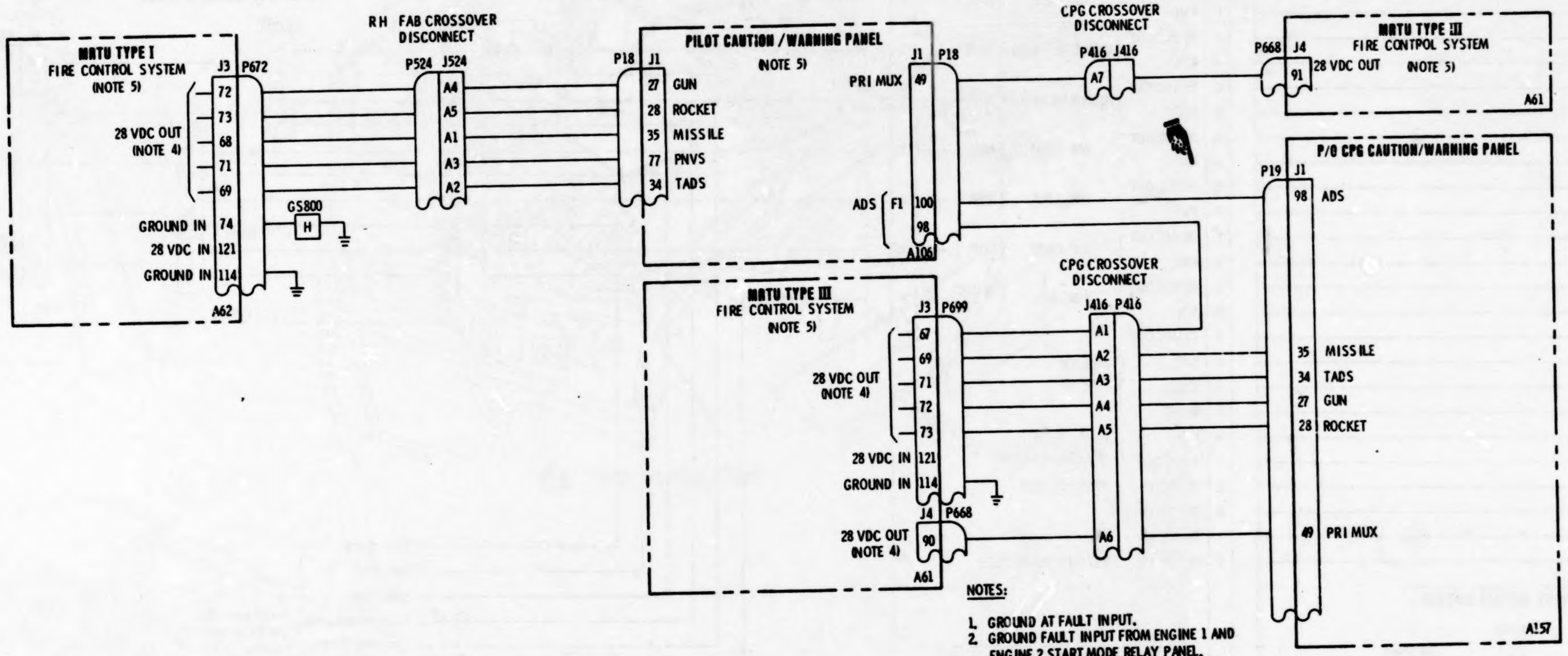
SHEET 1 OF 3 MM04/1-749-1B

9-32-2. CPG CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)


CPG CAUTION/WARNING PANEL
P31 J2
J2 P31
A B C D E F G H I J K L M N O P Q R S T U V W X
E 28 VDC OUT
F RTN
A 28 VDC OUT
B RTN
C 28 VDC OUT
D RTN
G 28 VDC OUT
H RTN
N 28 VDC OUT
P RTN
K 28 VDC OUT
J RTN
L 28 VDC OUT
M RTN
T 28 VDC OUT
U RTN
R RESET
S RESET
w RTN
v 5 VDC OUT
j 28 VDC IN
d 28 VDC IN
e 28 VDC IN
f 28 VDC IN
BUCS FAIL
LOW RPM ROTOR
HIGH RPM ROTOR
ENG 1 OUT
ENG 2 OUT
ENG CHOP
FIRE APU
MASTER CAUTION
PRESS TO TEST INTEGRAL LIGHTING
PRESS TO TEST
BRT/DIM CONTROLLER
NOTE 1
28 VDC IN
t X Y b c a Z
P20 SP1
PILOT MASTER CAUTION/WARNING LIGHTS
P456 J456
A12
AFT CROSSOVER DISCONNECT
DASE COLLECTIVE/BUCS
FLIGHT CONTROLS
P/O PILOT MATRIX MODULE
P482 J18
A13 A3 A12 A2 A6 A4 A15 A14 A7 A5
TB1-10
F D E C A B
TB1-51
H J G L M K A C B
J7 P435
A9 A10 A3 A4
J2 P469
A7
A326
POWERPLANTS (NOTE 3)
POWERPLANTS (NOTE 2)
P
ENG CHOP
ENG 2 OUT
ENG 1 OUT
HIGH RPM ROTOR
LOW RPM ROTOR
FIRE APU 28 VDC IN
PILOT MASTER CAUTION/WARNING LIGHTS
P/O PILOT MATRIX MODULE
TB1-42
TB1-43
A G
HI
LO
CPG EDGE LIGHT PANEL
J14 P466
B14
B13
CH. 1 NO. 2
A326
k HI
m LO
PANEL EDGE LIGHT
DS1
g 28 VDC OUT
h 28 VDC OUT
A B
GS240
A157

SHEET 2 OF 3 MM04/1-749-2A

9-32-2. CPG CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)

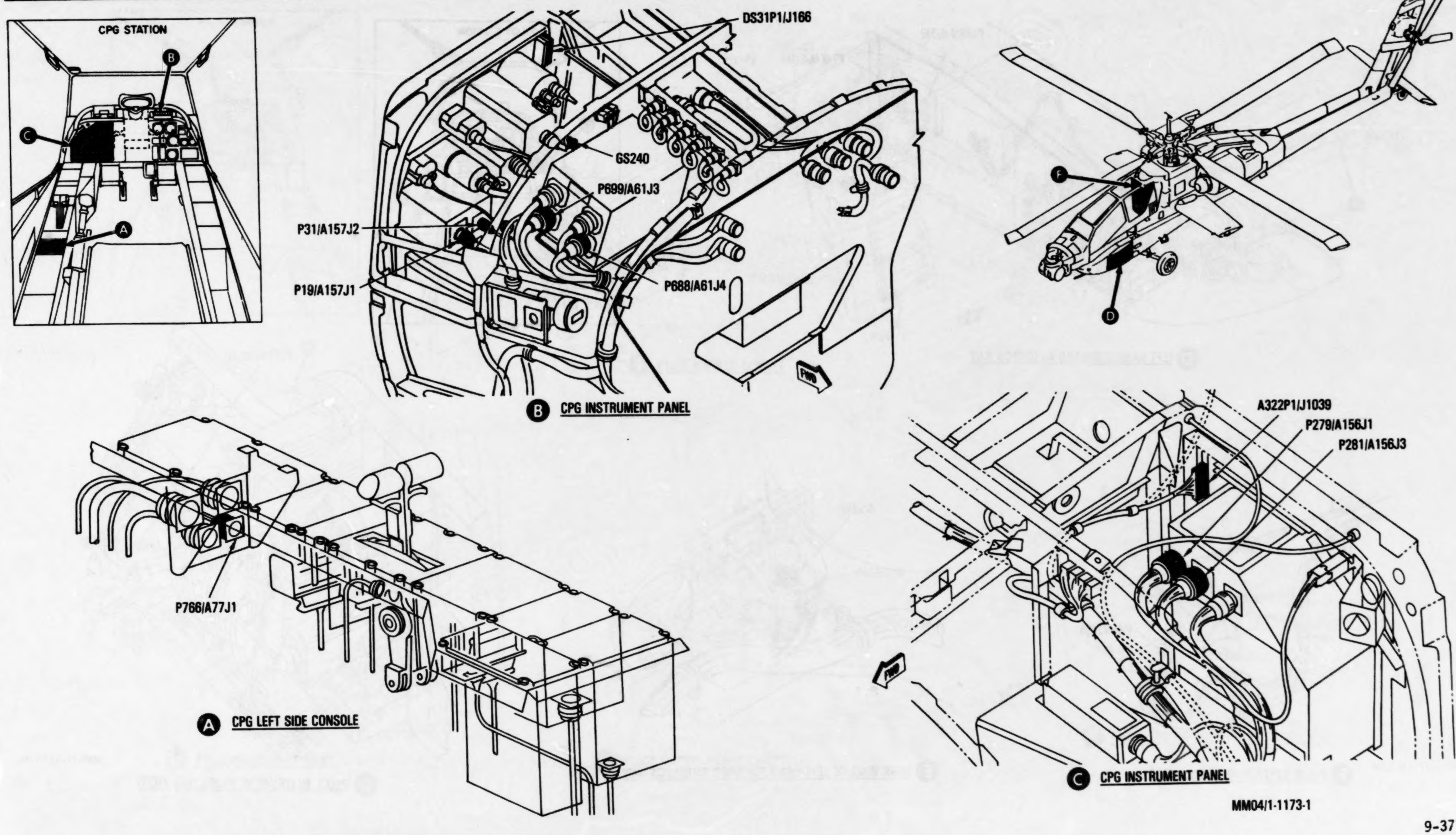

MRTU TYPE I
FIRE CONTROL SYSTEM
(NOTE 5)
J3
P672
72
73
68
71
69
28 VDC OUT
(NOTE 4)
GROUND IN
74
28 VDC IN
121
GROUND IN
114
A62
GS800
H
RH FAB CROSSOVER
DISCONNECT
P524
J524
A4
A5
A1
A3
A2
PILOT CAUTION/WARNING PANEL
(NOTE 5)
P18
J1
27
GUN
28
ROCKET
35
MISSILE
77
PNVS
34
TADS
J1
P18
PRI MUX
49
ADS
F1
100
98
A106
CPG CROSSOVER
DISCONNECT
P416
J416
A7
P668
J4
91
MRTU TYPE III
FIRE CONTROL SYSTEM
28 VDC OUT
(NOTE 5)
A61
P/O CPG CAUTION/WARNING PANEL
P19
J1
98
ADS
MRTU TYPE III
FIRE CONTROL SYSTEM
(NOTE 5)
J3
P699
67
69
71
72
73
28 VDC OUT
(NOTE 4)
28 VDC IN
121
GROUND IN
114
J4
P668
28 VDC OUT
(NOTE 4)
90
A61
CPG CROSSOVER
DISCONNECT
J416
P416
A1
A2
A3
A4
A5
A6
35
MISSILE
34
TADS
27
GUN
28
ROCKET
49
PRI MUX
A157

NOTES:

1. GROUND AT FAULT INPUT.
2. GROUND FAULT INPUT FROM ENGINE 1 AND ENGINE 2 START MODE RELAY PANEL.
3. GROUND FAULT INPUT FROM ENGINE OUT WARNING UNIT.
4. AT FAILURE.
5. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

SHEET 3 OF 3 MM04/1-749-3E

9-32-3. CPG CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


CPG STATION
B
C
A
DS31P1/J166
GS240
P699/A61J3
P31/A157J2
P19/A157J1
P688/A61J4
FWD
F
D
A322P1/J1039
P279/A156J1
P281/A156J3
FWD
P766/A77J1

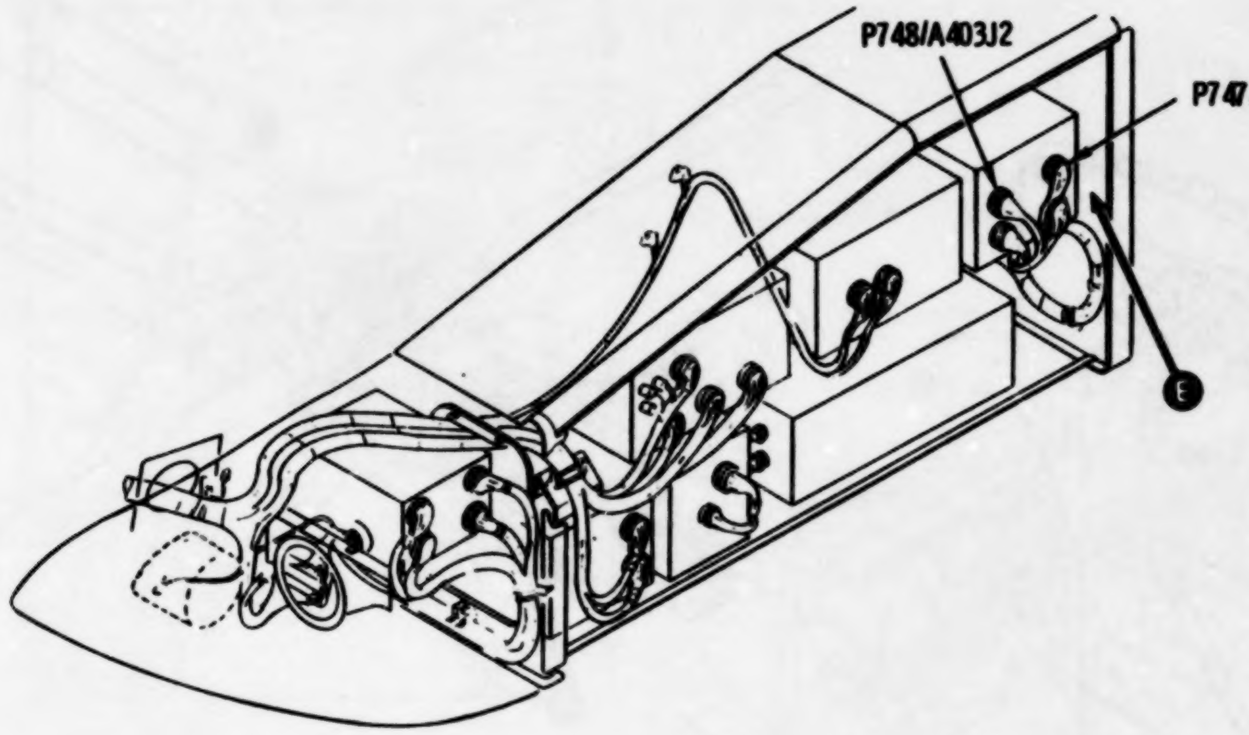
B CPG INSTRUMENT PANEL

A CPG LEFT SIDE CONSOLE

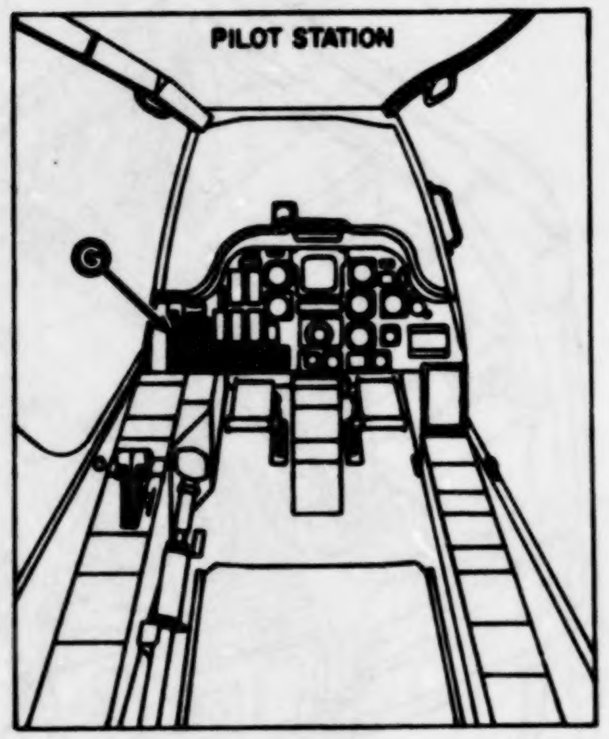
C CPG INSTRUMENT PANEL

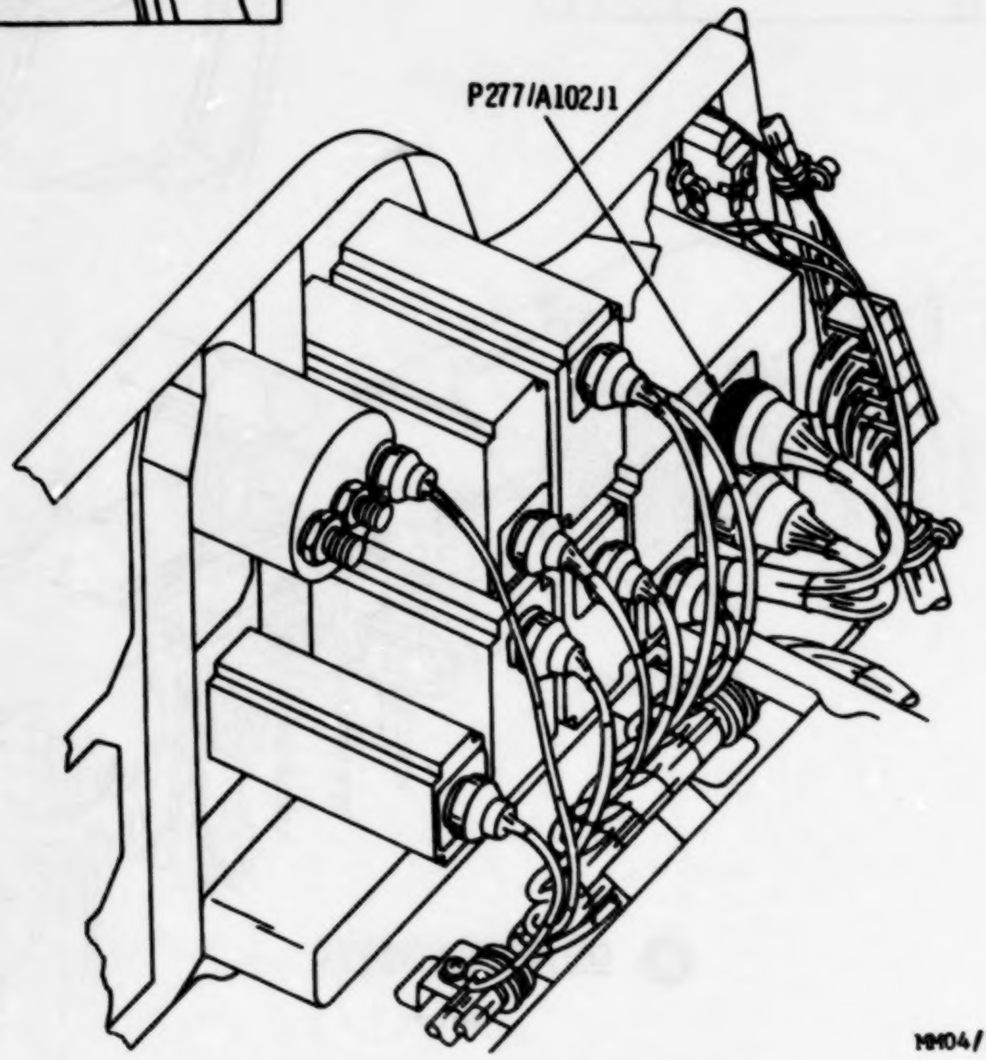
MM04/1-1173-1

9-32-3. CPG CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


P748/A403J2
P747/A403J1
E

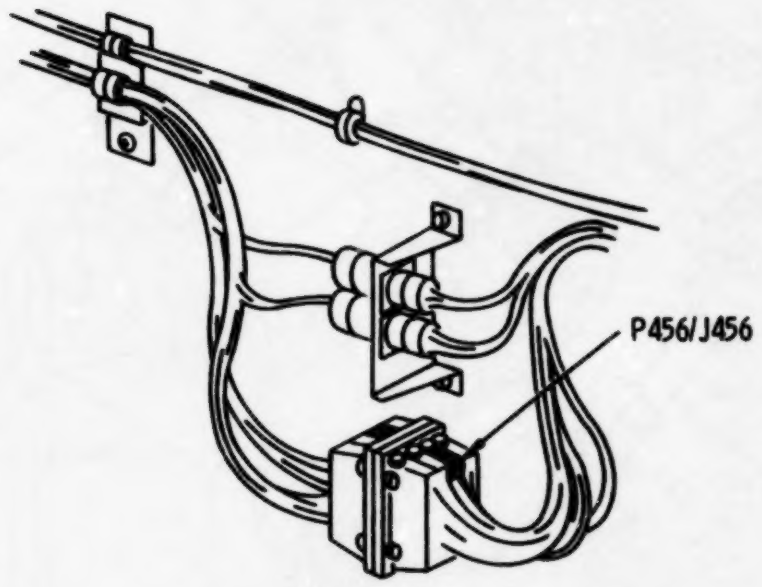
D LEFT HAND FORWARD AVIONICS BAY


PILOT STATION
G

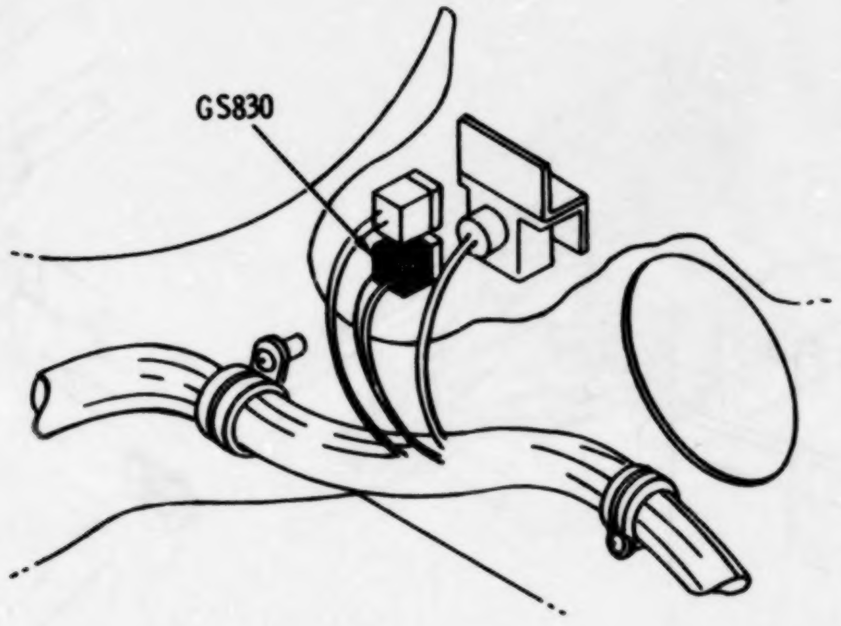

P277/A102J1

MM04/1-1173-2B

G PILOT INSTRUMENT PANEL (AFT VIEW)

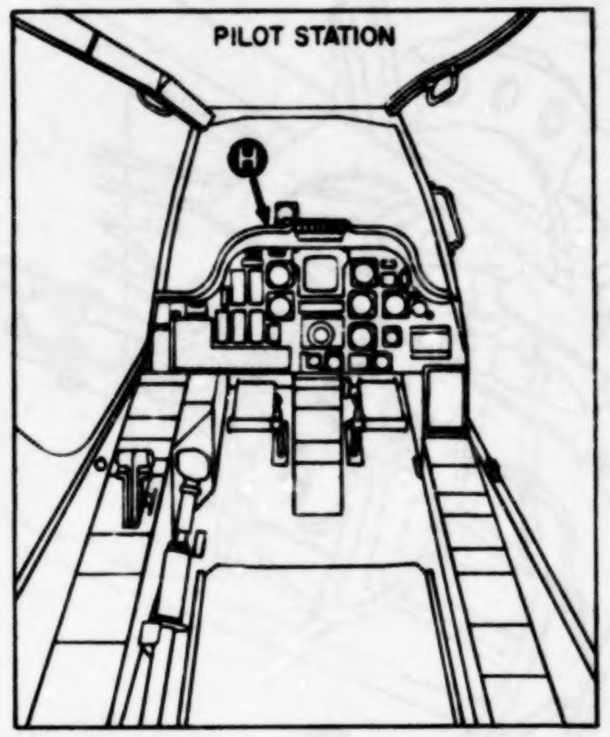


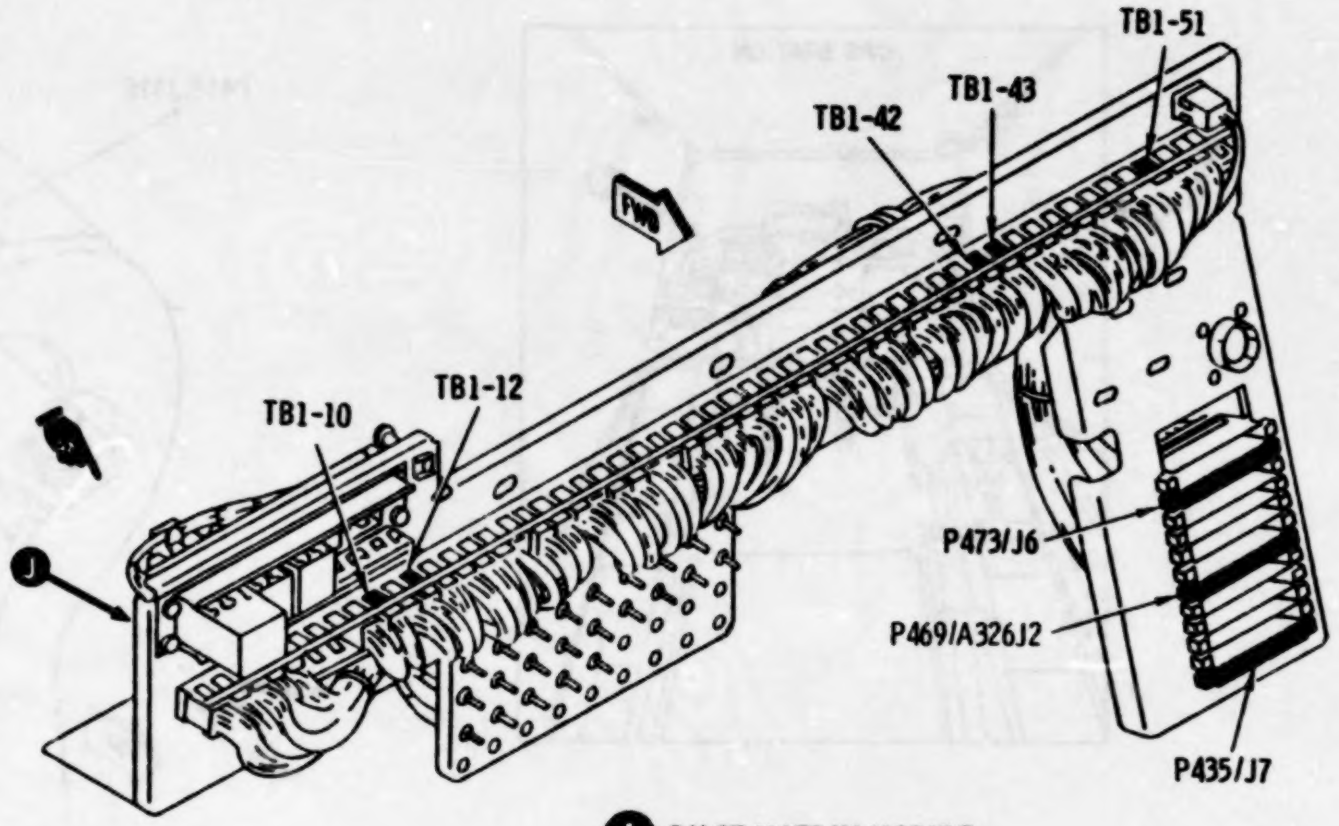
F PILOT STATION REAR BULKHEAD



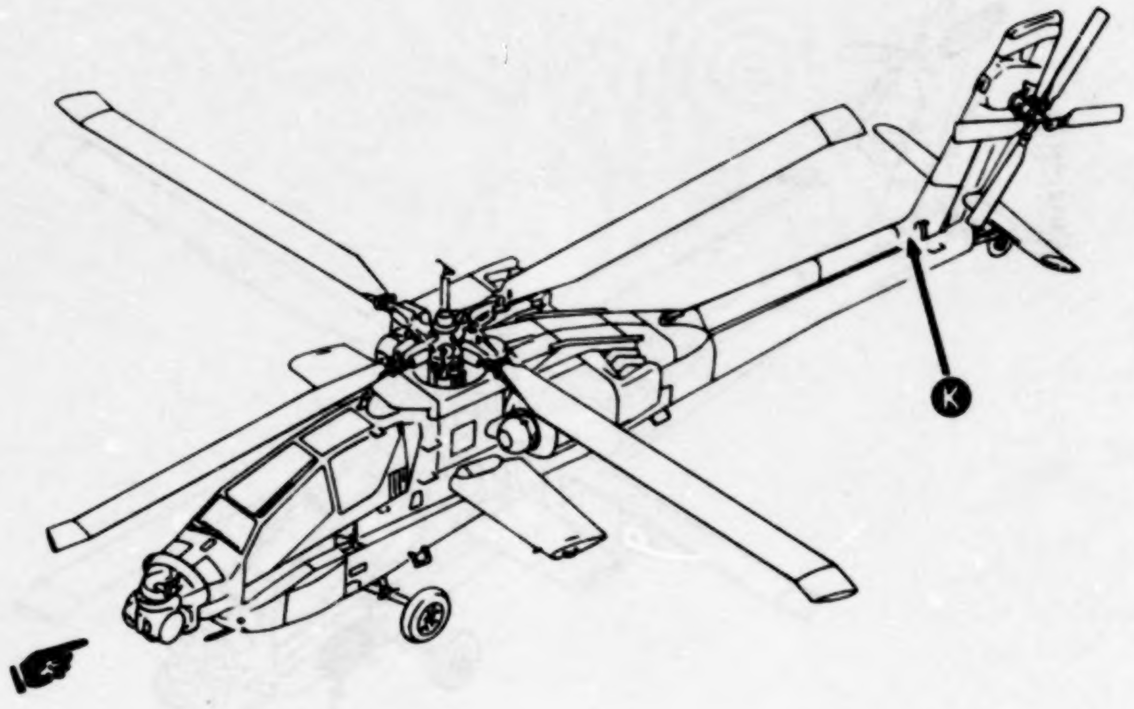
E REAR WALL OF LEFT HAND FORWARD AVIONICS BAY

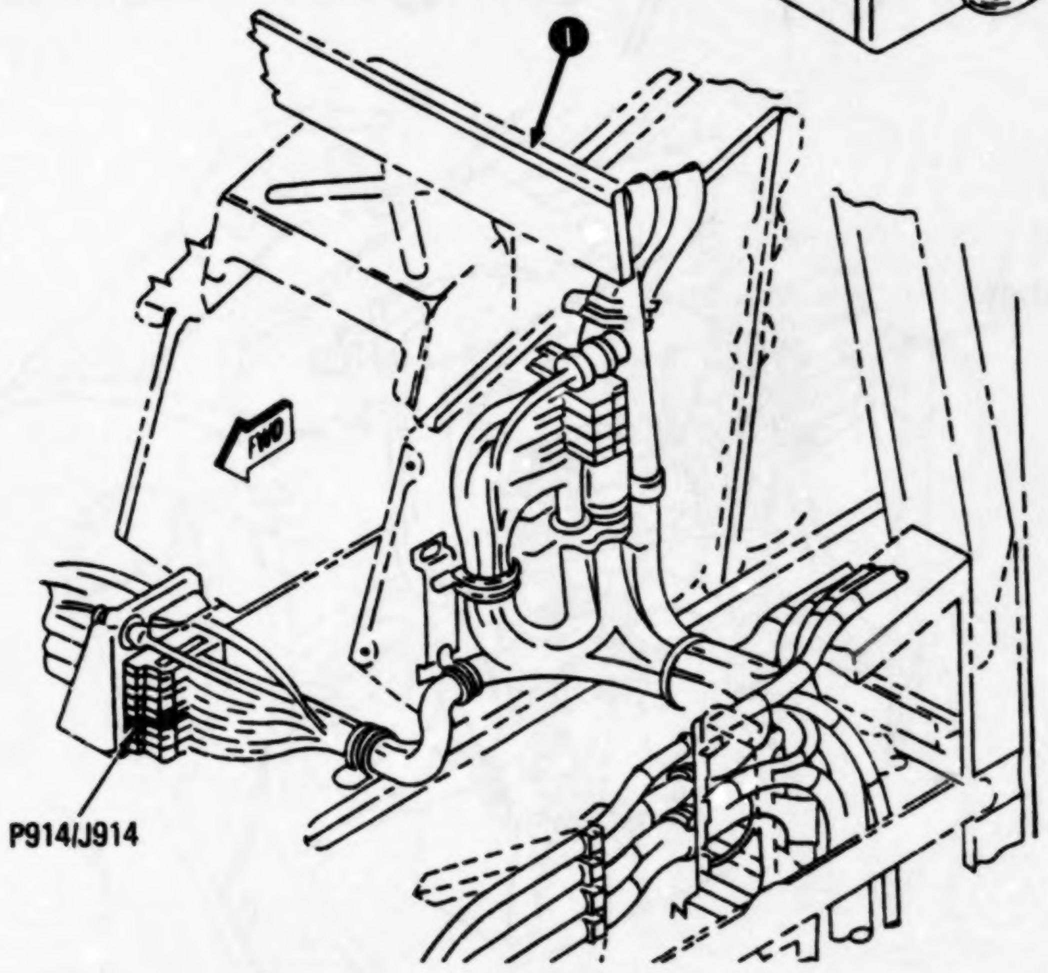
9-32-3. CPG CAUTION WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


PILOT STATION
H

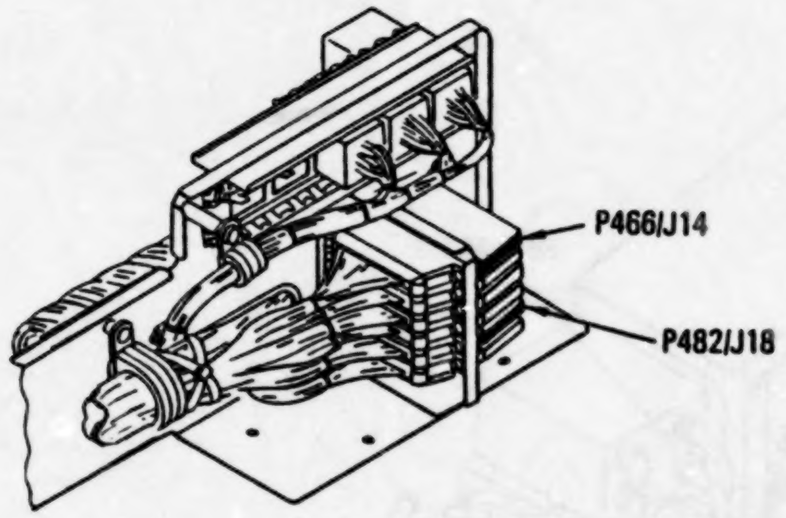

TB1-51
TB1-43
TB1-42
FWD
TB1-12
TB1-10
J
P473/J6
P469/A326J2
P435/J7

I PILOT MATRIX MODULE

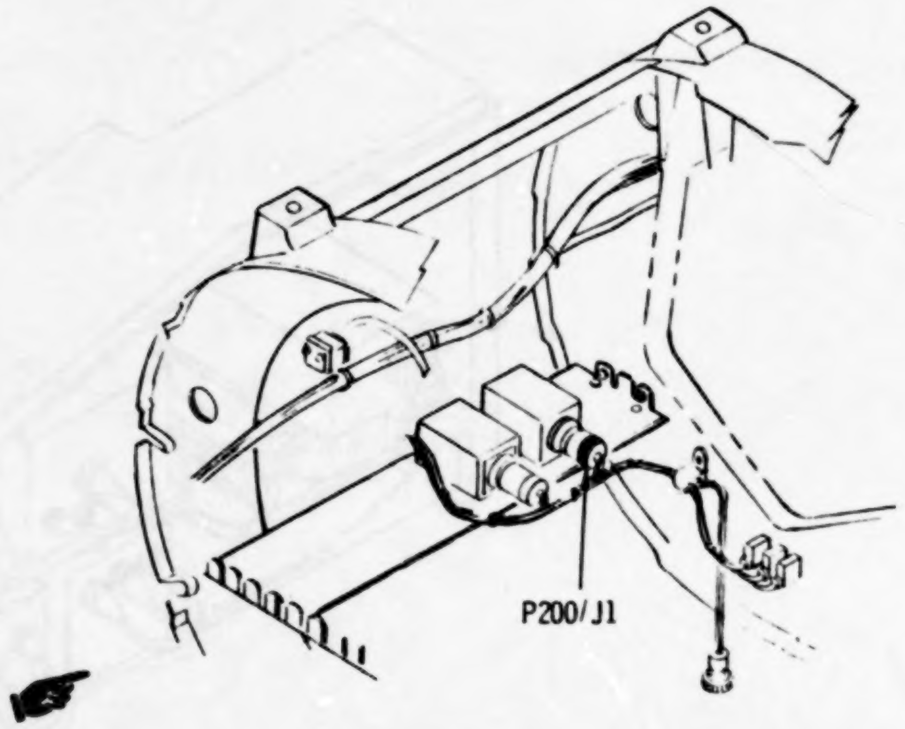



I
FWD
P914/J914

H PILOT INSTRUMENT PANEL


P466/J14
P482/J18

J PILOT MATRIX MODULE (ROTATED)

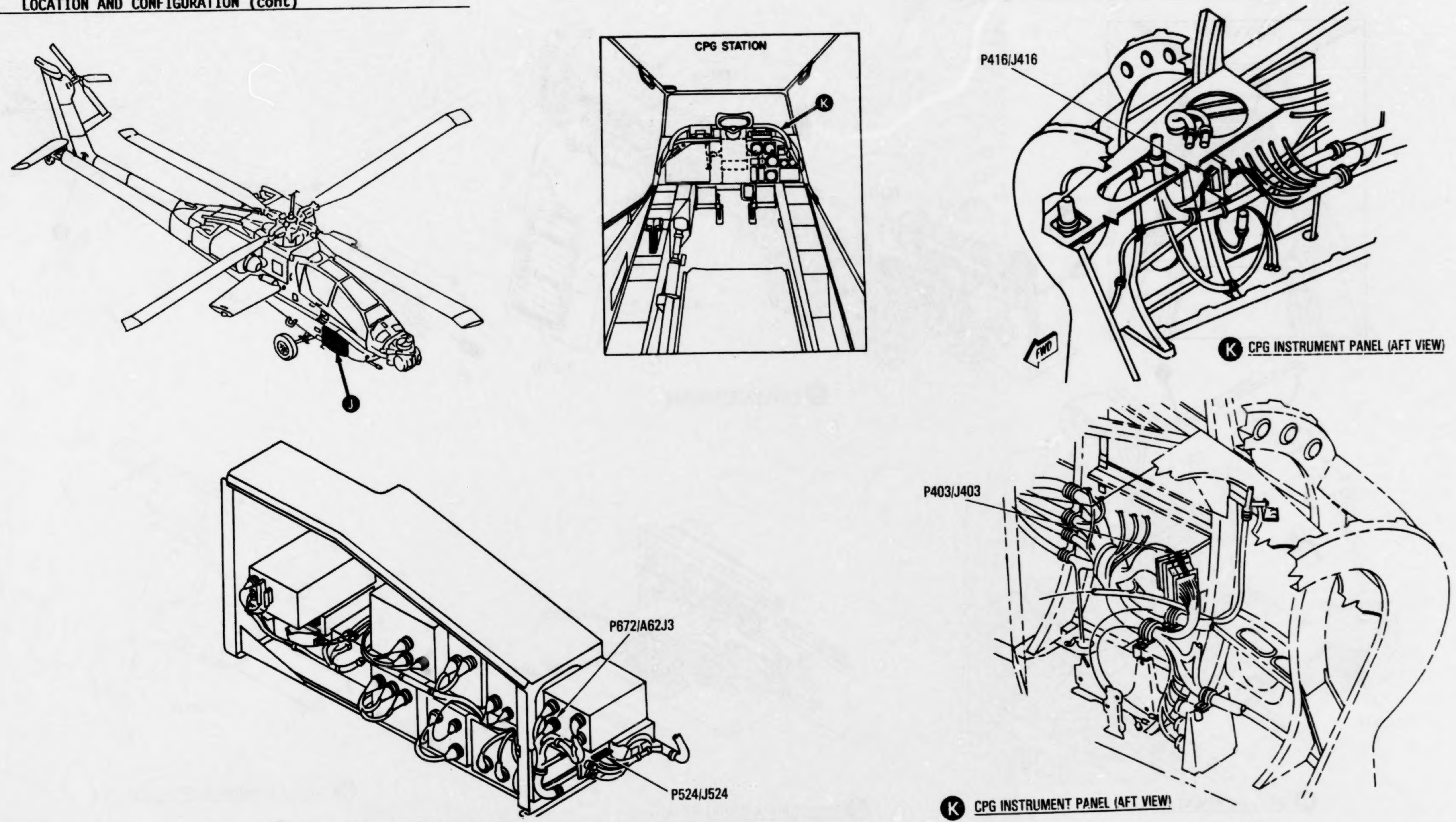


K TAILBOOM THROUGH COVERS L545, R545

MM04/1-1173-3C

END OF TASK

9-32-3. CPG CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


J
CPG STATION
K
P416/J416
FWD
P672/A62J3
P524/J524
P403/J403

Ⓙ RIGHT HAND FORWARD AVIONICS BAY

Ⓚ CPG INSTRUMENT PANEL (AFT VIEW)

Ⓚ CPG INSTRUMENT PANEL (AFT VIEW)

MM04/1-1173-4B

9-32-4. EMERG BATT CAUT CIRCUIT BREAKER (CB29) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

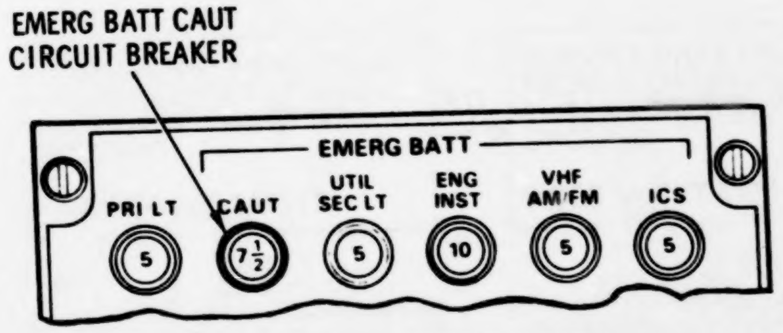
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

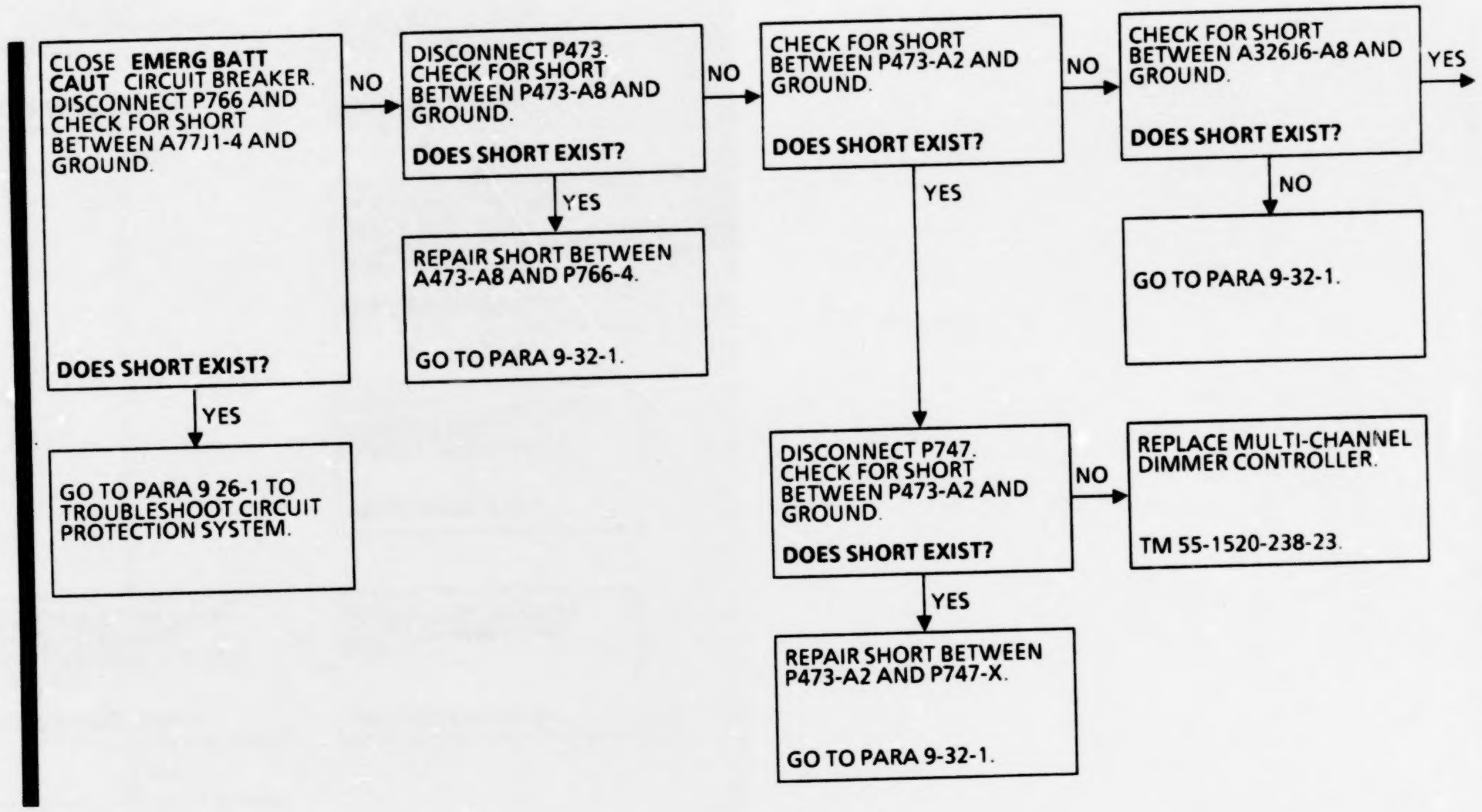
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed CPG circuit breaker panel No. 1 removed Note: On CPG circuit breaker panel no. 1 P767, P768, P769 remain connected.


EMERG BATT CAUT CIRCUIT BREAKER
EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5

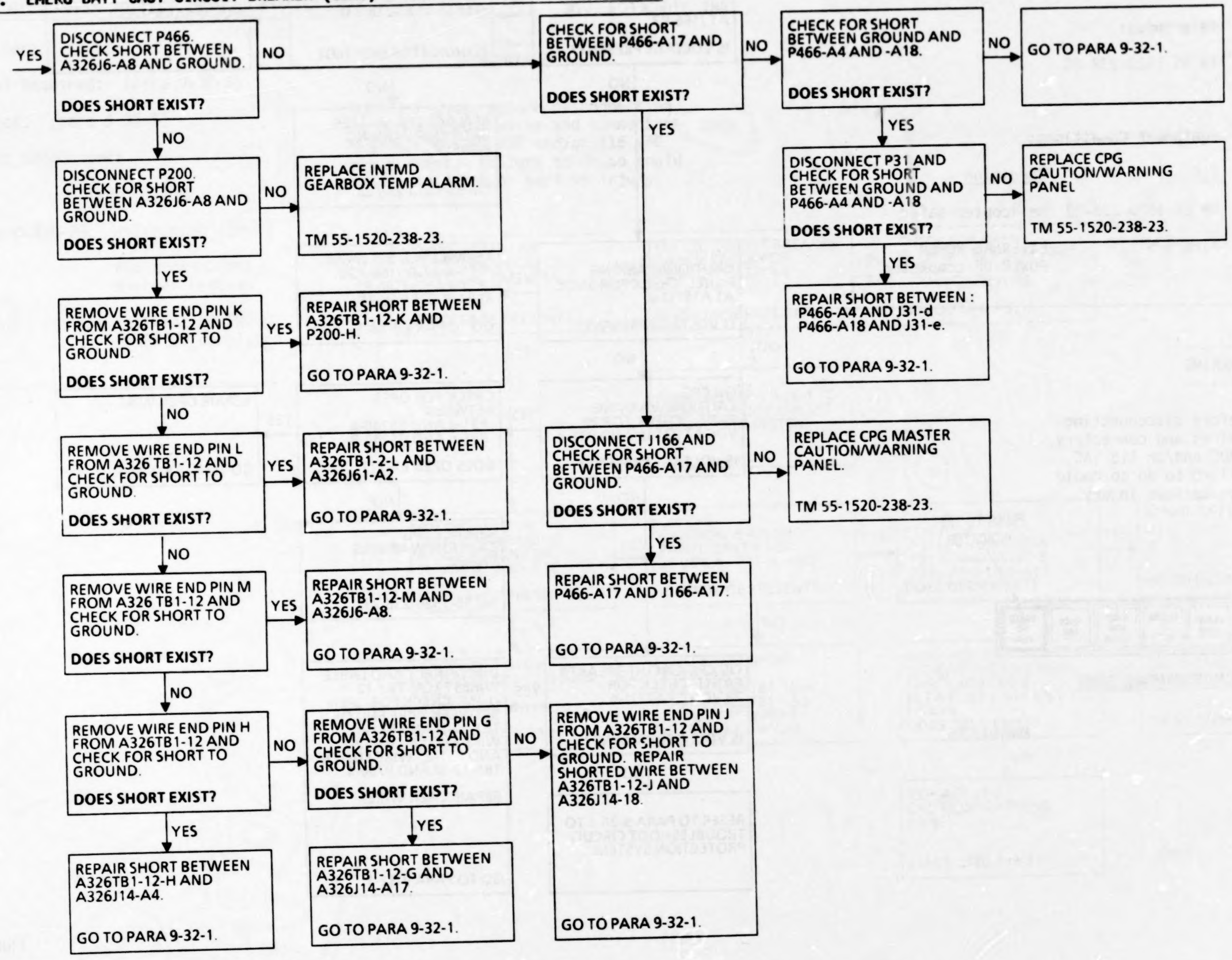
CPG CIRCUIT BREAKER PANEL

MM04/1-1174A


CLOSE EMERG BATT CAUT CIRCUIT BREAKER. DISCONNECT P766 AND CHECK FOR SHORT BETWEEN A77J1-4 AND GROUND.
DOES SHORT EXIST?
YES
GO TO PARA 9 26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT P473. CHECK FOR SHORT BETWEEN P473-A8 AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A473-A8 AND P766-4.
GO TO PARA 9-32-1.
NO
CHECK FOR SHORT BETWEEN P473-A2 AND GROUND.
DOES SHORT EXIST?
YES
DISCONNECT P747. CHECK FOR SHORT BETWEEN P473-A2 AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN P473-A2 AND P747-X.
GO TO PARA 9-32-1.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROLLER.
TM 55-1520-238-23.
NO
CHECK FOR SHORT BETWEEN A326J6-A8 AND GROUND.
DOES SHORT EXIST?
YES
NO
GO TO PARA 9-32-1.

GO TO NEXT PAGE

9-32-4. EMERG BATT CAUT CIRCUIT BREAKER (CB29) - DOES NOT STAY CLOSED (cont)


YES
DISCONNECT P466. CHECK SHORT BETWEEN A326J6-A8 AND GROUND. DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN P466-A17 AND GROUND. DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN GROUND AND P466-A4 AND -A18. DOES SHORT EXIST?
NO
GO TO PARA 9-32-1.
YES
DISCONNECT P31 AND CHECK FOR SHORT BETWEEN GROUND AND P466-A4 AND -A18. DOES SHORT EXIST?
NO
REPLACE CPG CAUTION/WARNING PANEL. TM 55-1520-238-23.
YES
REPAIR SHORT BETWEEN : P466-A4 AND J31-d P466-A18 AND J31-e. GO TO PARA 9-32-1.
YES
DISCONNECT J166 AND CHECK FOR SHORT BETWEEN P466-A17 AND GROUND. DOES SHORT EXIST?
NO
REPLACE CPG MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23.
YES
REPAIR SHORT BETWEEN P466-A17 AND J166-A17. GO TO PARA 9-32-1.
NO
DISCONNECT P200. CHECK FOR SHORT BETWEEN A326J6-A8 AND GROUND. DOES SHORT EXIST?
NO
REPLACE INTMD GEARBOX TEMP ALARM. TM 55-1520-238-23.
YES
REMOVE WIRE END PIN K FROM A326TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-12-K AND P200-H. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN L FROM A326 TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-2-L AND A326J61-A2. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN M FROM A326 TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-12-M AND A326J6-A8. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN H FROM A326TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-12-H AND A326J14-A4. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN G FROM A326TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-12-G AND A326J14-A17. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN J FROM A326TB1-12 AND CHECK FOR SHORT TO GROUND. REPAIR SHORTED WIRE BETWEEN A326TB1-12-J AND A326J14-18. GO TO PARA 9-32-1.

END OF TASK

9-32-5. PRESS TO TEST INDICATOR - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

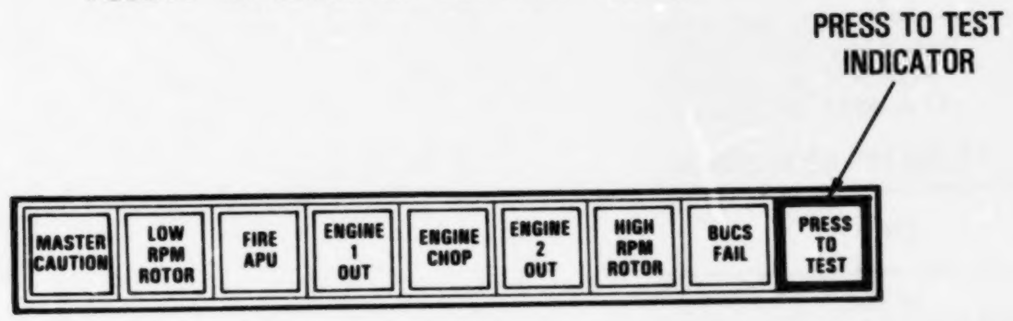
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

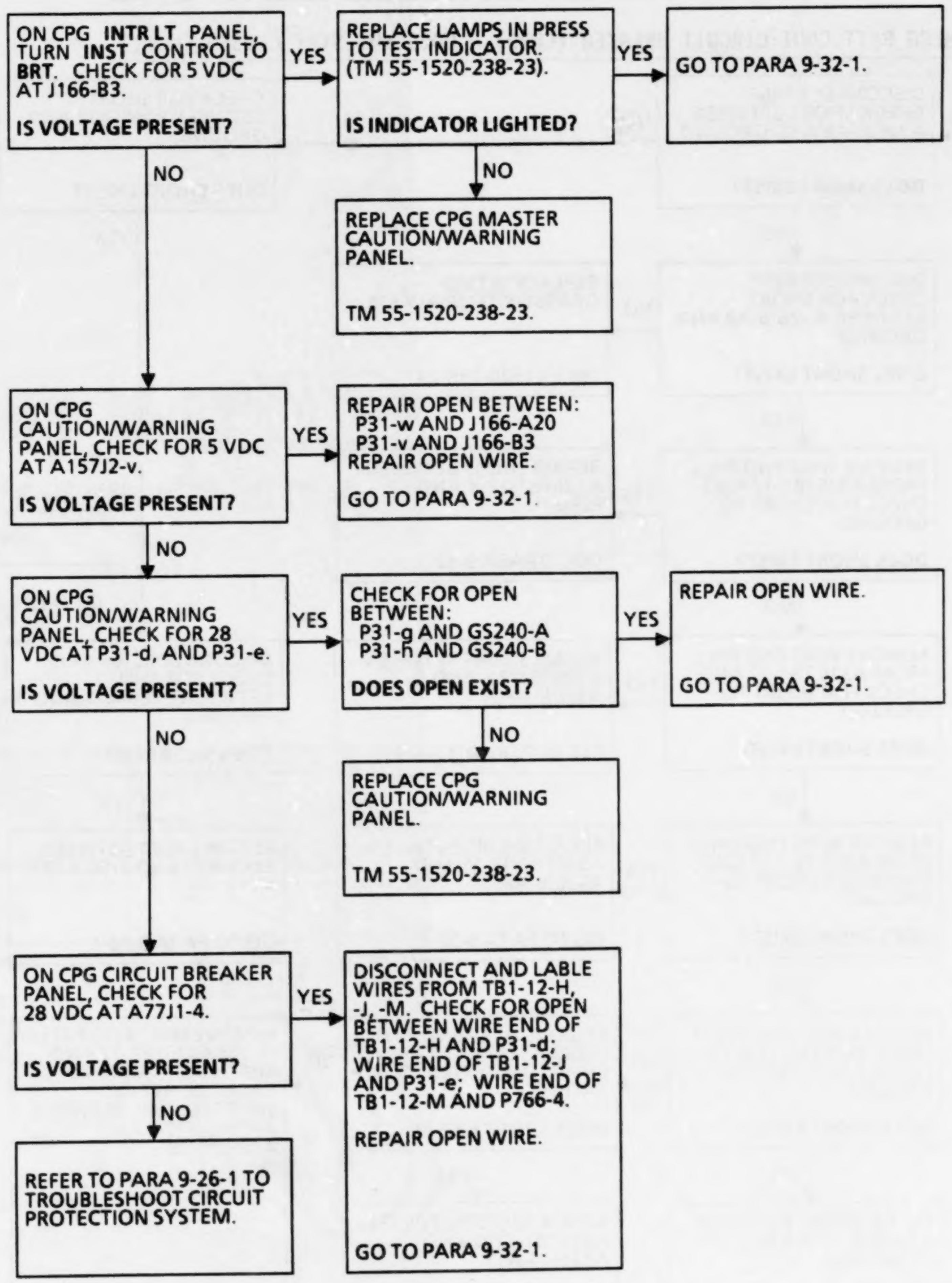
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


PRESS TO TEST INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

CPG MASTER CAUTION/WARNING PANEL

MM04/1-1205


ON CPG INTR LT PANEL, TURN INST CONTROL TO BRT. CHECK FOR 5 VDC AT J166-B3.
IS VOLTAGE PRESENT?
YES
REPLACE LAMPS IN PRESS TO TEST INDICATOR. (TM 55-1520-238-23).
IS INDICATOR LIGHTED?
YES
GO TO PARA 9-32-1.
NO
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
ON CPG CAUTION/WARNING PANEL, CHECK FOR 5 VDC AT A157J2-v.
IS VOLTAGE PRESENT?
YES
REPAIR OPEN BETWEEN: P31-w AND J166-A20 P31-v AND J166-B3 REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT P31-d, AND P31-e.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P31-g AND GS240-A P31-h AND GS240-B
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
ON CPG CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT A77J1-4.
IS VOLTAGE PRESENT?
YES
DISCONNECT AND LABLE WIRES FROM TB1-12-H, -J, -M. CHECK FOR OPEN BETWEEN WIRE END OF TB1-12-H AND P31-d; WIRE END OF TB1-12-J AND P31-e; WIRE END OF TB1-12-M AND P766-4.
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
REFER TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

END OF TASK

9-32-6. ALL CAUTION/WARNING MASTER CAUTION AND INDICATORS - DO NOT LIGHT WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-5)

Personnel Required: (para 9-32-5)

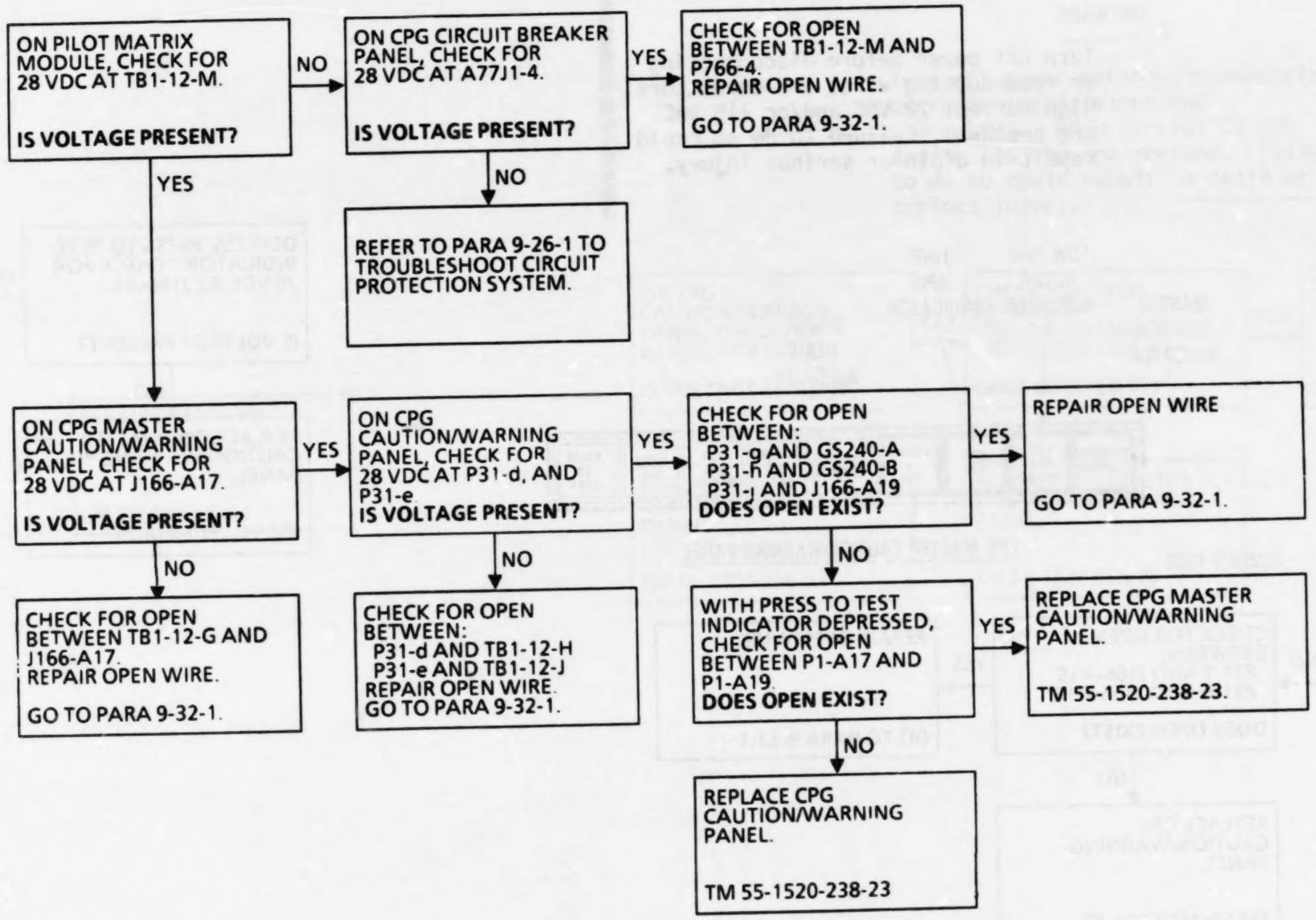
References: (para 9-32-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Non-transparent barrier removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON PILOT MATRIX MODULE, CHECK FOR 28 VDC AT TB1-12-M.
IS VOLTAGE PRESENT?

ON CPG CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT A77J1-4.
IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN TB1-12-M AND P766-4.
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.

REFER TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

ON CPG MASTER CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J166-A17.
IS VOLTAGE PRESENT?

ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT P31-d, AND P31-e.
IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P31-g AND GS240-A
P31-h AND GS240-B
P31-j AND J166-A19
DOES OPEN EXIST?

REPAIR OPEN WIRE
GO TO PARA 9-32-1.

CHECK FOR OPEN BETWEEN TB1-12-G AND J166-A17.
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.

CHECK FOR OPEN BETWEEN:
P31-d AND TB1-12-H
P31-e AND TB1-12-J
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.

WITH PRESS TO TEST INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN P1-A17 AND P1-A19.
DOES OPEN EXIST?

REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23

END OF TASK

9-32-7. MASTER CAUTION INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

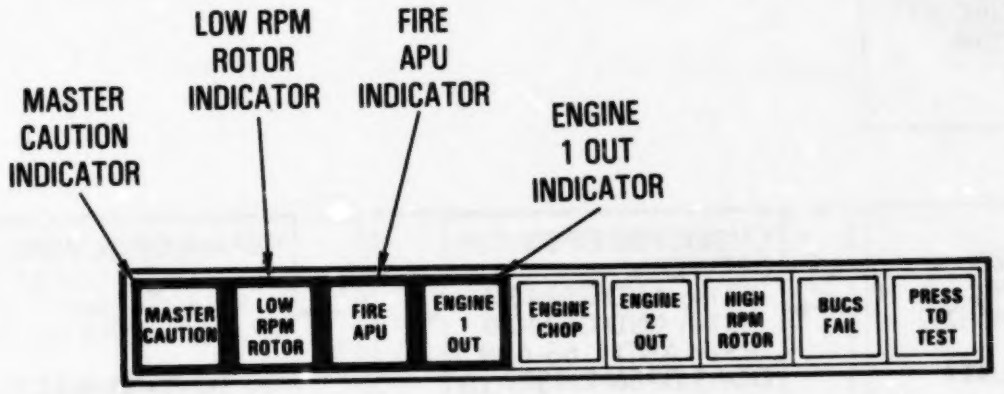
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

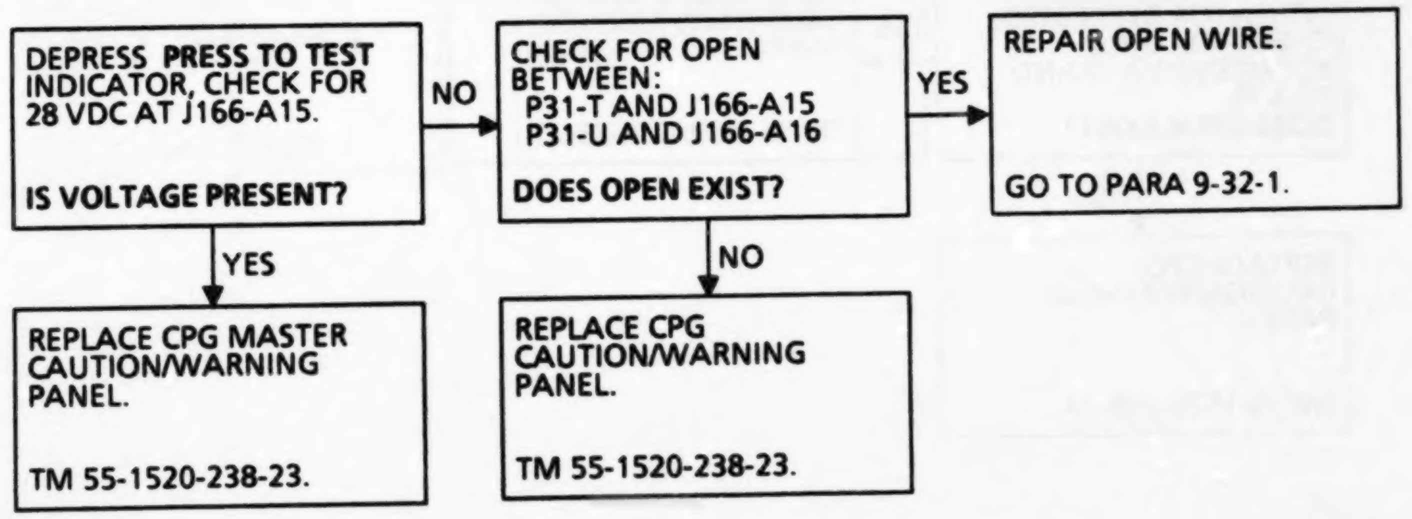
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


MASTER CAUTION INDICATOR
LOW RPM ROTOR INDICATOR
FIRE APU INDICATOR
ENGINE 1 OUT INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

CPG MASTER CAUTION/WARNING PANEL

MM04/1-1206


DEPRESS PRESS TO TEST INDICATOR, CHECK FOR 28 VDC AT J166-A15.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN:
P31-T AND J166-A15
P31-U AND J166-A16
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
YES
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-32-8. LOW RPM ROTOR INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-7)

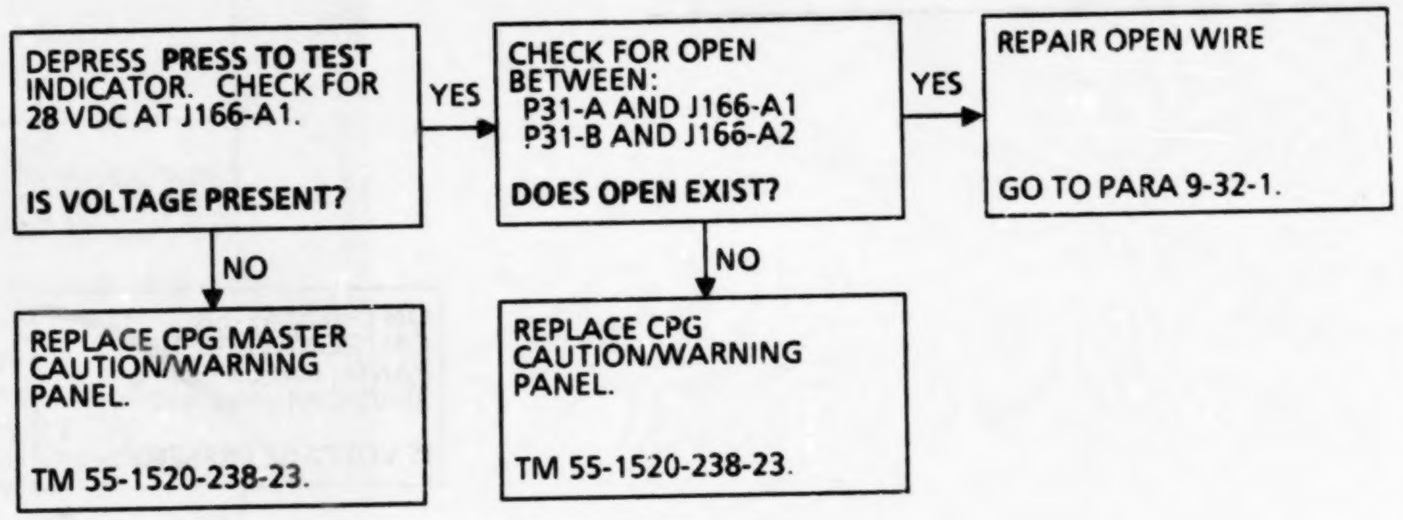
Personnel Required: (para 9-32-7)

References: (para 9-32-7)

Equipment Conditions: (para 9-32-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DEPRESS PRESS TO TEST INDICATOR. CHECK FOR 28 VDC AT J166-A1.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P31-A AND J166-A1
P31-B AND J166-A2
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-32-1.
NO
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-32-9. FIRE APU INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-7)

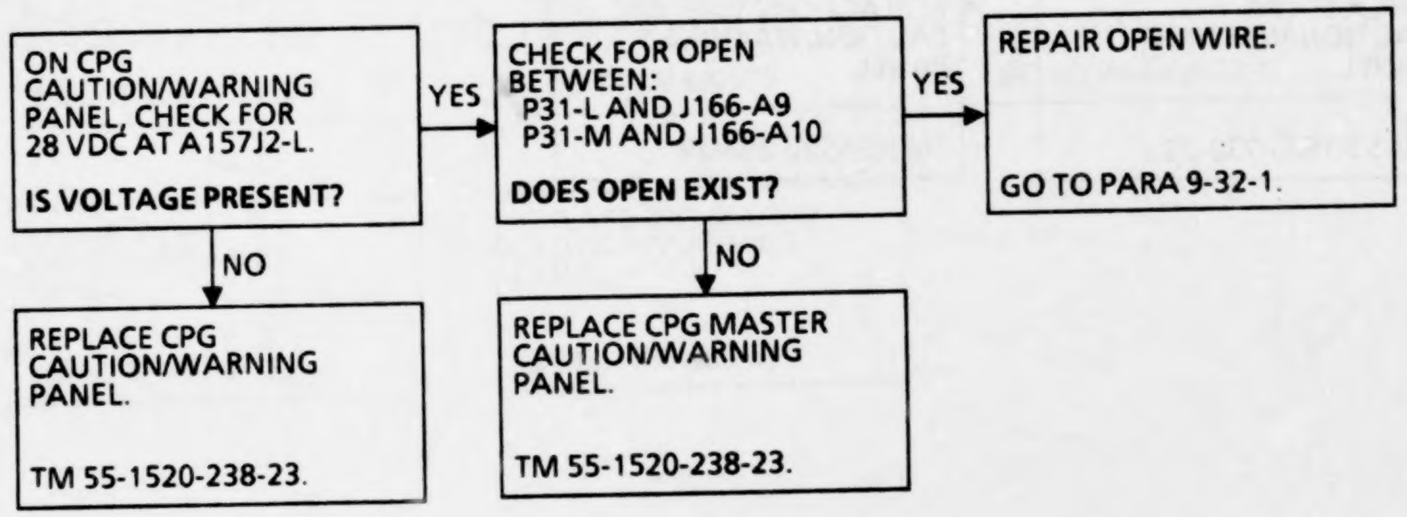
Personnel Required: (para 9-32-7)

References: (para 9-32-7)

Equipment Conditions: (para 9-32-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT A157J2-L.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P31-L AND J166-A9
P31-M AND J166-A10
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-32-10. ENGINE 1 OUT INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-7)

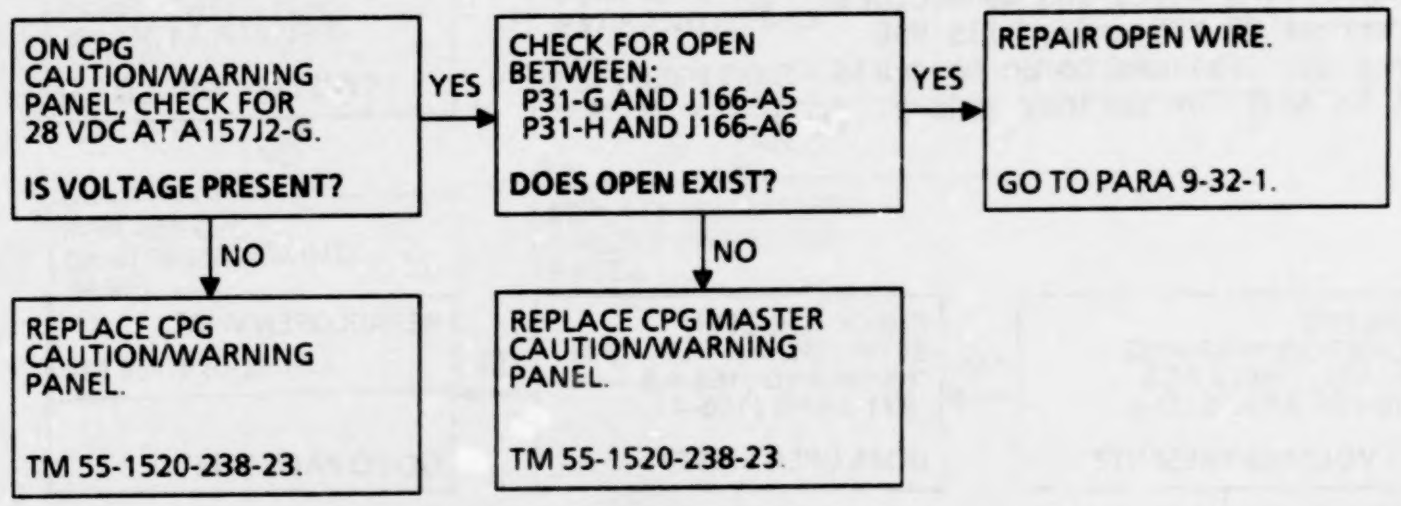
Personnel Required: (para 9-32-7)

References: (para 9-32-7)

Equipment Conditions: (para 9-32-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT A157J2-G.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P31-G AND J166-A5
P31-H AND J166-A6
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-32-11. ENGINE CHOP INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

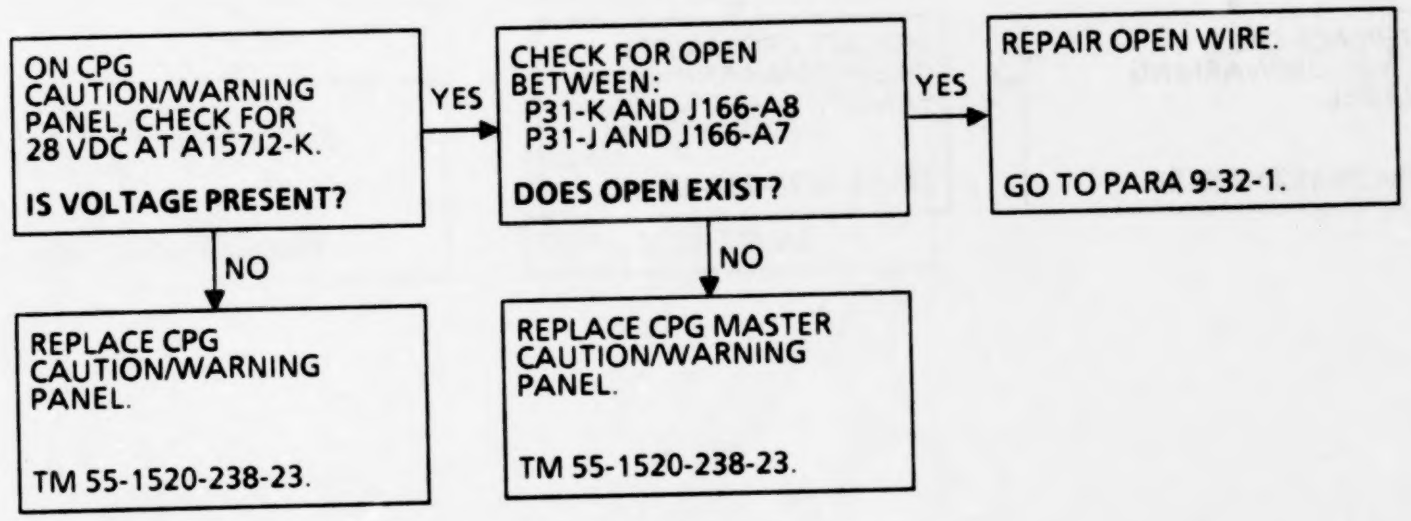
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP - completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT A157J2-K.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P31-K AND J166-A8
P31-J AND J166-A7
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-32-12. ENGINE 2 OUT INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-11)

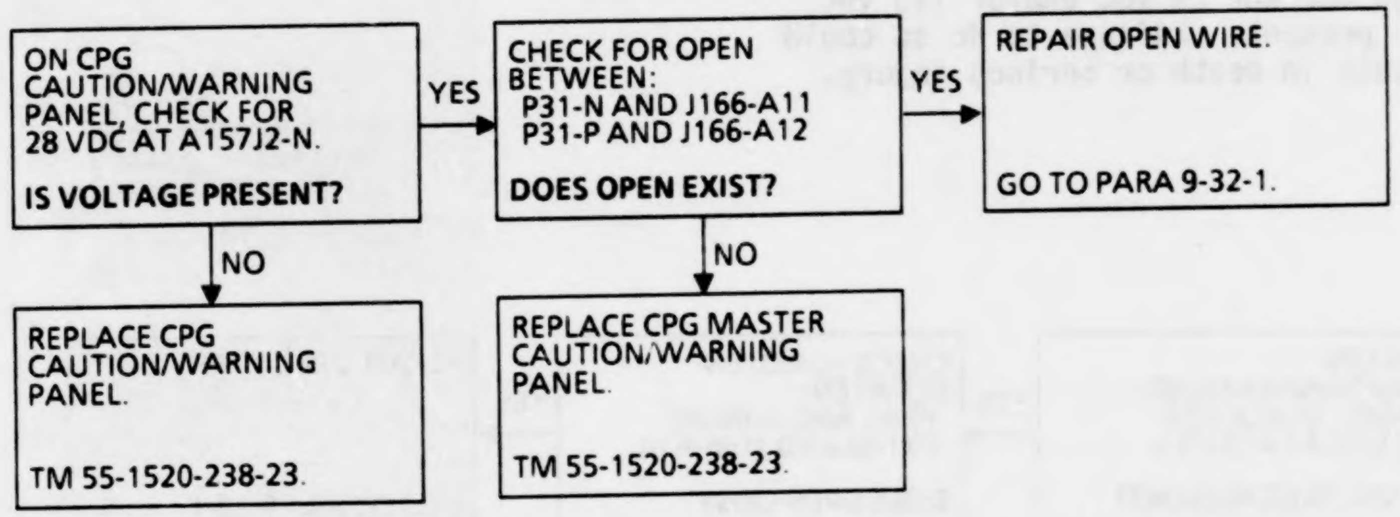
Personnel Required: (para 9-32-11)

References: (para 9-32-11)

Equipment Conditions: (para 9-32-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT A157J2-N.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P31-N AND J166-A11
P31-P AND J166-A12
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-32-13. HIGH RPM ROTOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-11)

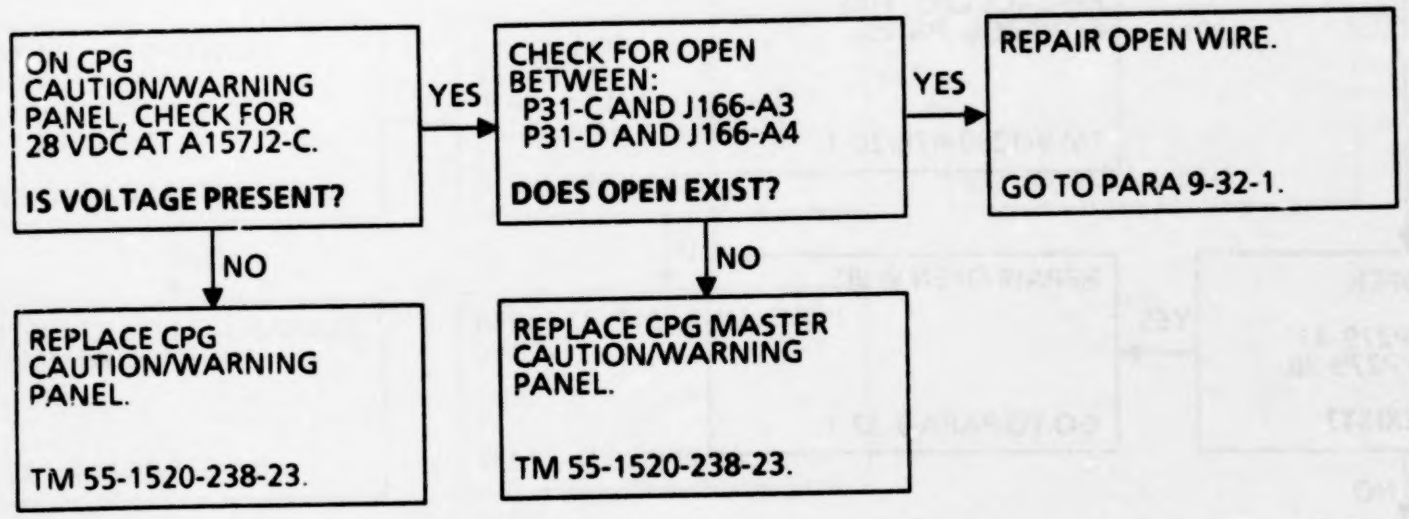
Personnel Required: (para 9-32-11)

References: (para 9-32-11)

Equipment Conditions: (para 9-32-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT A157J2-C.
IS VOLTAGE PRESENT?
YES
NO
CHECK FOR OPEN BETWEEN:
P31-C AND J166-A3
P31-D AND J166-A4
DOES OPEN EXIST?
YES
NO
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-32-14. BUCS FAIL INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-11)

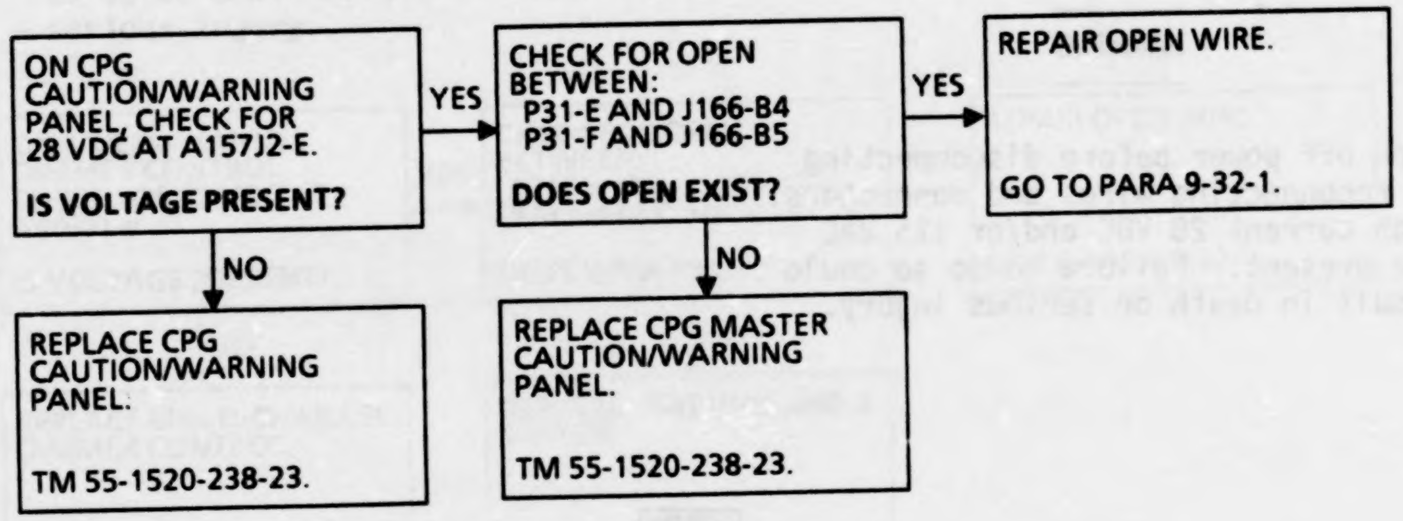
Personnel Required: (para 9-32-11)

References: (para 9-32-11)

Equipment Conditions: (para 9-32-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT A157J2-E.
IS VOLTAGE PRESENT?
YES
NO
CHECK FOR OPEN BETWEEN:
P31-E AND J166-B4
P31-F AND J166-B5
DOES OPEN EXIST?
YES
NO
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-32-15. ARM/SAFE ADVISORY LIGHT - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

References:

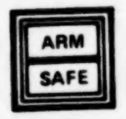
TM 55-1520-238-23
TM 9-1230-476-20-1

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L40 cover removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

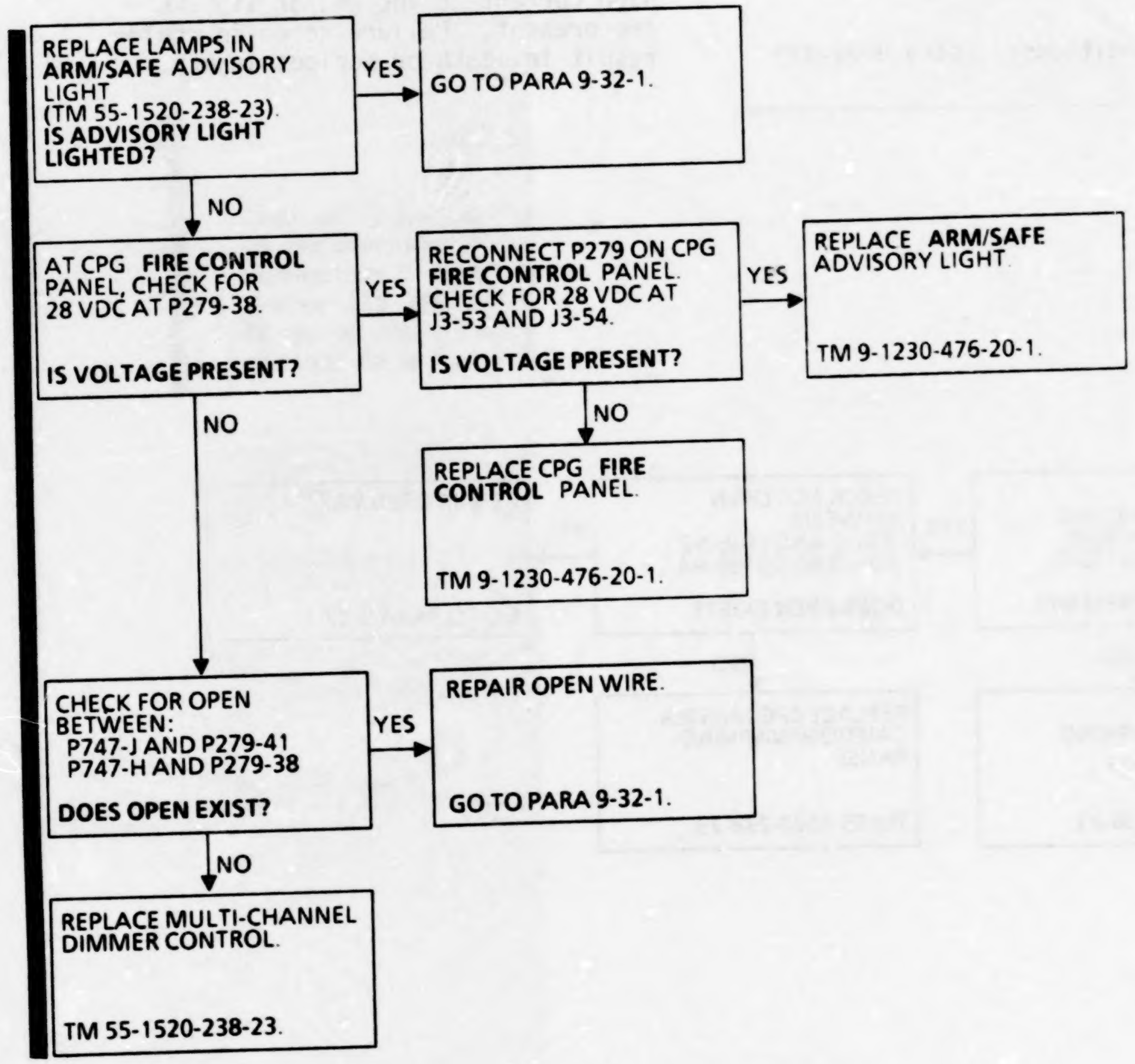
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ARM/SAFE ADVISORY LIGHT

MM04/1-1208


REPLACE LAMPS IN ARM/SAFE ADVISORY LIGHT (TM 55-1520-238-23). IS ADVISORY LIGHT LIGHTED?
YES
GO TO PARA 9-32-1.
NO
AT CPG FIRE CONTROL PANEL, CHECK FOR 28 VDC AT P279-38. IS VOLTAGE PRESENT?
YES
RECONNECT P279 ON CPG FIRE CONTROL PANEL. CHECK FOR 28 VDC AT J3-53 AND J3-54. IS VOLTAGE PRESENT?
YES
REPLACE ARM/SAFE ADVISORY LIGHT. TM 9-1230-476-20-1.
NO
REPLACE CPG FIRE CONTROL PANEL. TM 9-1230-476-20-1.
NO
CHECK FOR OPEN BETWEEN: P747-J AND P279-41 P747-H AND P279-38 DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-32-1.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL. TM 55-1520-238-23.

END OF TASK

9-32-16. FIRE PULL ENG 1 SWITCH - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-15)

Personnel Required: (para 9-32-15)

References:

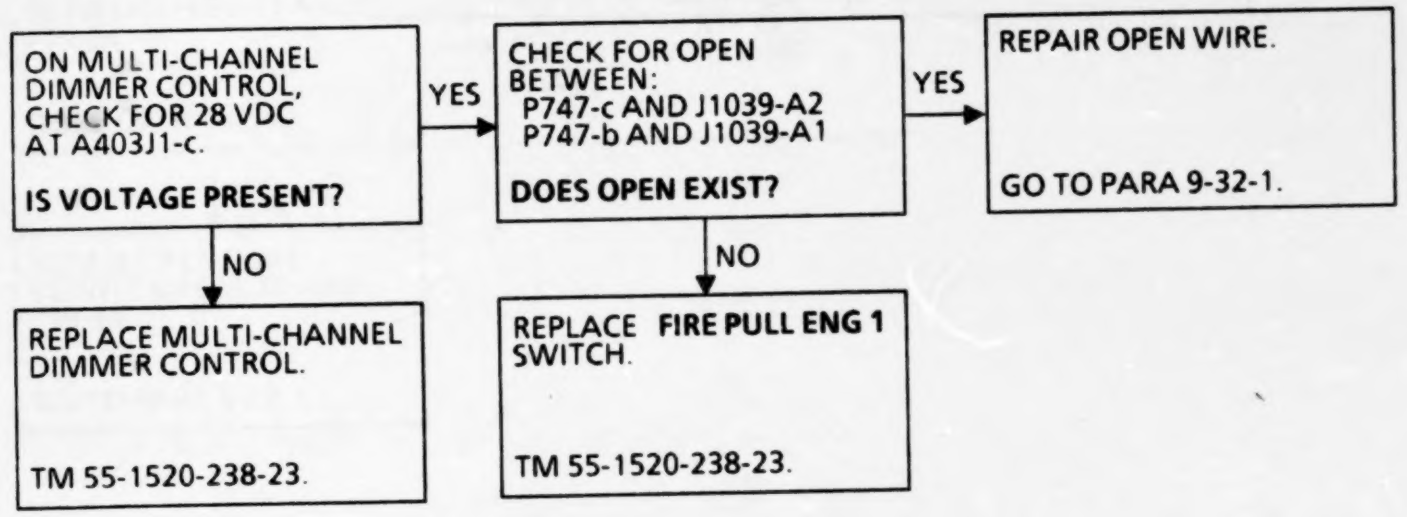
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT A403J1-c.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P747-c AND J1039-A2 P747-b AND J1039-A1
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
NO
REPLACE FIRE PULL ENG 1 SWITCH.
TM 55-1520-238-23.

END OF TASK

9-32-17. FIRE PULL ENG 2 SWITCH - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-15)

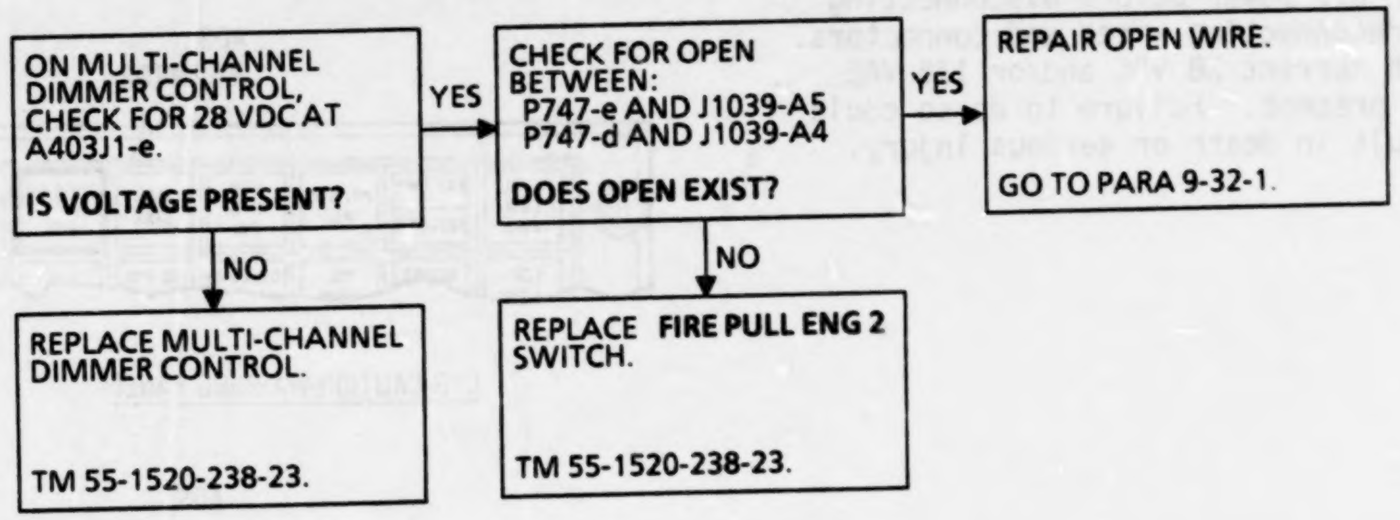
Personnel Required: (para 9-32-15)

References: (para 9-32-16)

Equipment Conditions: (para 9-32-16)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT A403J1-e.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P747-e AND J1039-A5 P747-d AND J1039-A4
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
NO
REPLACE FIRE PULL ENG 2 SWITCH.
TM 55-1520-238-23.

END OF TASK

9-32-18. PILOT AND CPG ADS INDICATORS - ARE NOT LIGHTED WITH CPG FCC MUX ON

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

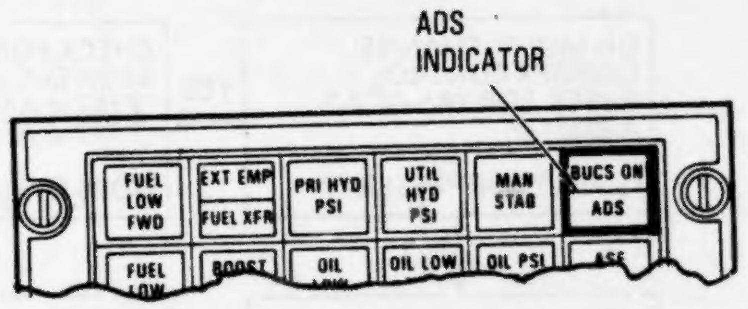
TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

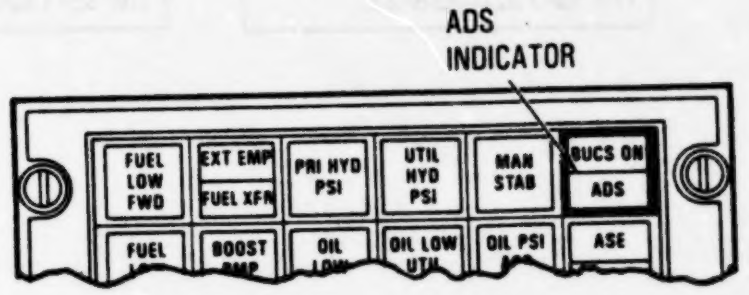
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - cover L40 removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

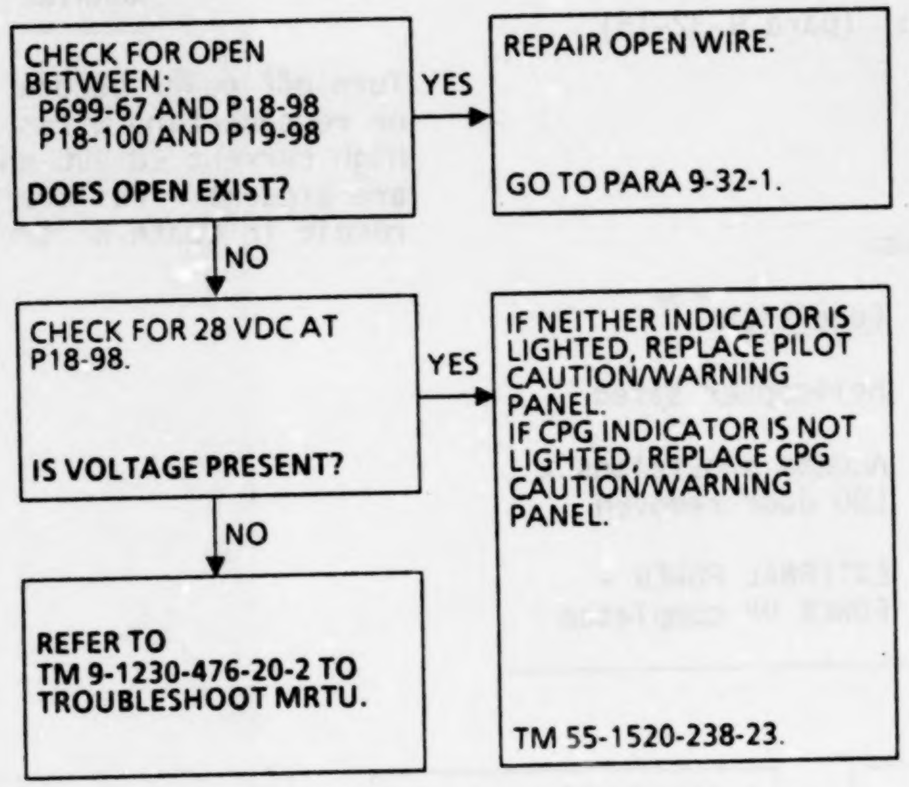

ADS INDICATOR
FUEL LOW FWD
EXT EMP
FUEL XFR
PRI HYD PSI
UTIL HYD PSI
MAN STAB
BUCS ON
ADS
FUEL LOW
BOOST
OIL
OIL LOW
OIL PSI
ASE

CPG CAUTION/WARNING PANEL


ADS INDICATOR
FUEL LOW FWD
EXT EMP
FUEL XFR
PRI HYD PSI
UTIL HYD PSI
MAN STAB
BUCS ON
ADS
FUEL
BOOST
OIL
OIL LOW
OIL PSI
ASE

PILOT CAUTION/WARNING PANEL

MM04/1-1175A



CHECK FOR OPEN BETWEEN:
P699-67 AND P18-98
P18-100 AND P19-98

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

NO: CHECK FOR 28 VDC AT P18-98.

IS VOLTAGE PRESENT?

YES: IF NEITHER INDICATOR IS LIGHTED, REPLACE PILOT CAUTION/WARNING PANEL.
IF CPG INDICATOR IS NOT LIGHTED, REPLACE CPG CAUTION/WARNING PANEL.

TM 55-1520-238-23.

NO: REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

END OF TASK

9-32-19. CPG TADS INDICATOR - IS NOT LIGHTED WITH TADS SWITCH IN TADS POSITION

Tools: (para 9-32-18)

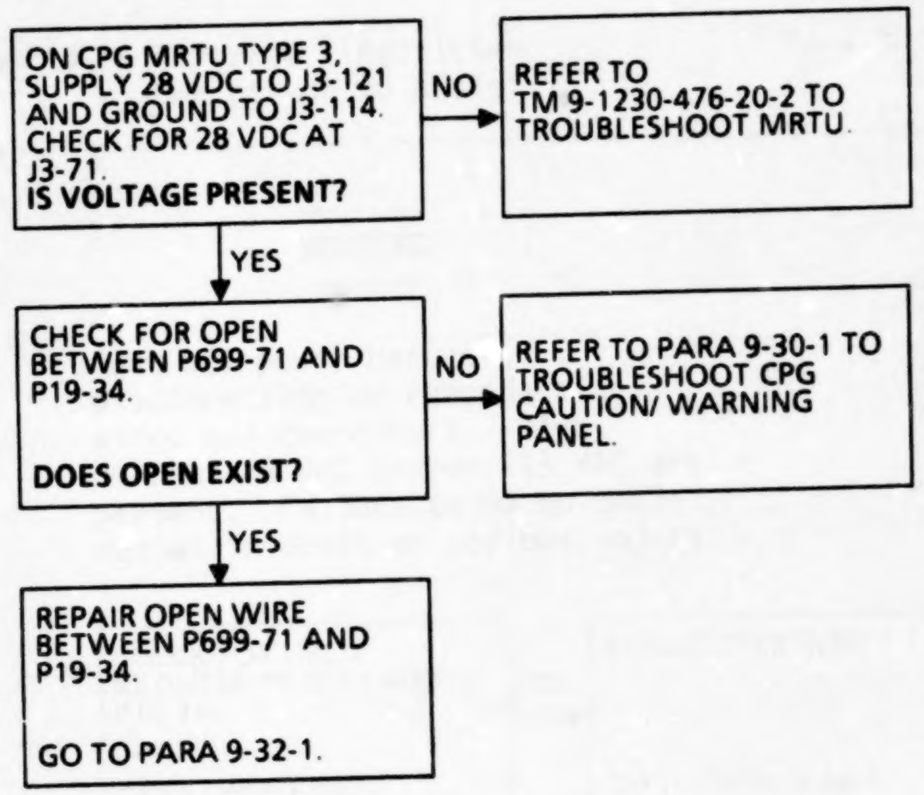
Personnel Required: (para 9-32-18)

References: (para 9-32-18)

Equipment Conditions: (para 9-32-18)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG MRTU TYPE 3, SUPPLY 28 VDC TO J3-121 AND GROUND TO J3-114. CHECK FOR 28 VDC AT J3-71. IS VOLTAGE PRESENT?

NO: REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

YES: CHECK FOR OPEN BETWEEN P699-71 AND P19-34. DOES OPEN EXIST?

NO: REFER TO PARA 9-30-1 TO TROUBLESHOOT CPG CAUTION/ WARNING PANEL.

YES: REPAIR OPEN WIRE BETWEEN P699-71 AND P19-34. GO TO PARA 9-32-1.

END OF TASK

9-32-20. PILOT TADS INDICATOR - IS NOT LIGHTED WITH TADS SWITCH IN TADS POSITION

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

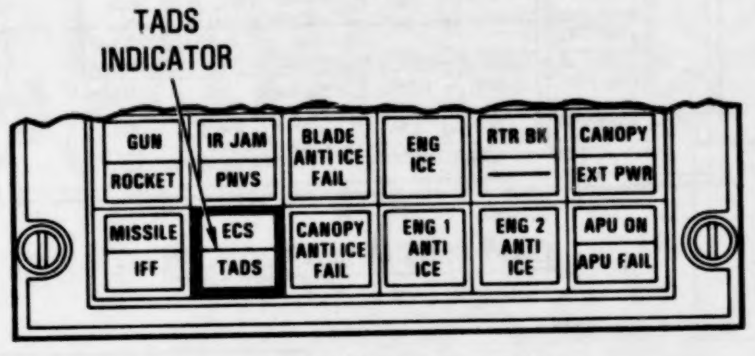
TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

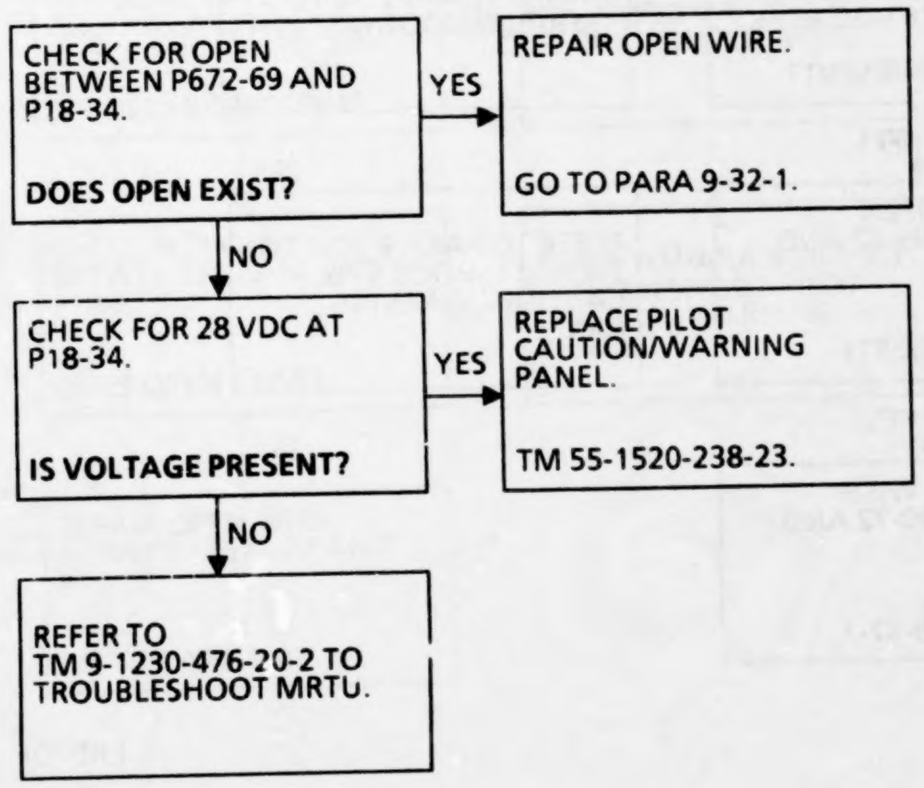
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


TADS INDICATOR
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

PILOT CAUTION/WARNING PANEL

MM04/1-1178


CHECK FOR OPEN BETWEEN P672-69 AND P18-34.
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE.
GO TO PARA 9-32-1.

NO: CHECK FOR 28 VDC AT P18-34.
IS VOLTAGE PRESENT?

YES: REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.

NO: REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

END OF TASK

9-32-21. CPG ROCKET INDICATOR - IS NOT LIGHTED WITH RKT SWITCH IN NORM POSITION

Tools: (para 9-32-20)

Personnel Required: (para 9-32-20)

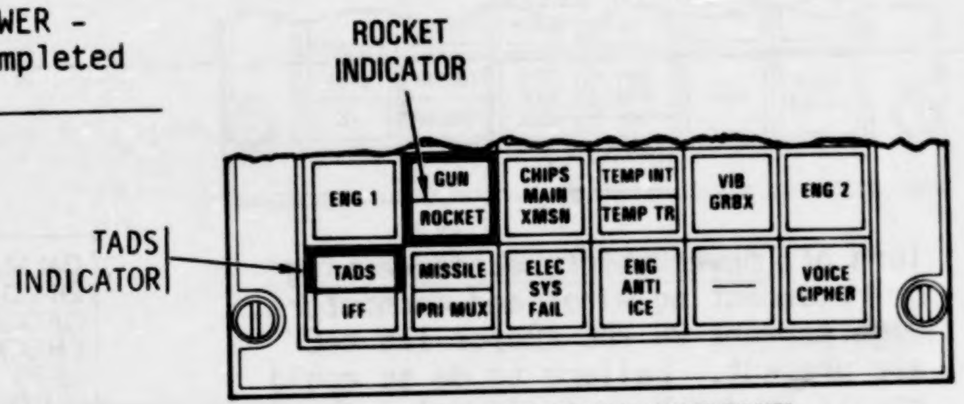
References: (para 9-32-20)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - cover L40 removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

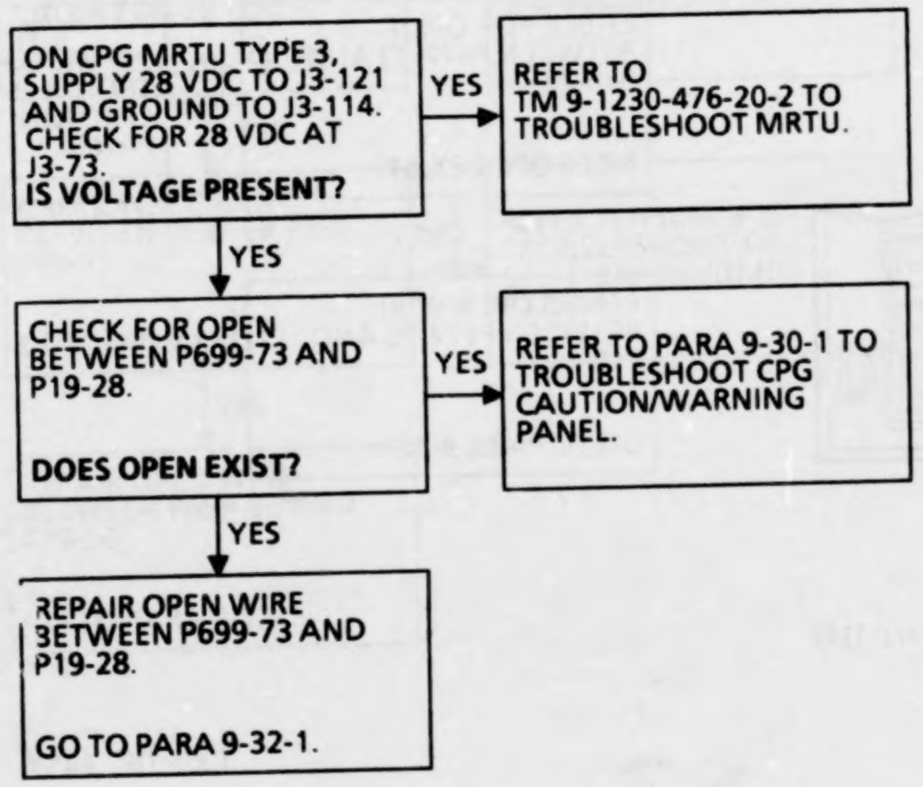
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ROCKET INDICATOR
TADS INDICATOR
ENG 1
GUN
ROCKET
CHIPS MAIN XMSN
TEMP INT
TEMP TR
VIB GRBX
ENG 2
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
VOICE CIPHER

CPG CAUTION/WARNING PANEL

MM04/1-1157


ON CPG MRTU TYPE 3, SUPPLY 28 VDC TO J3-121 AND GROUND TO J3-114. CHECK FOR 28 VDC AT J3-73.
IS VOLTAGE PRESENT?

YES: REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

YES: CHECK FOR OPEN BETWEEN P699-73 AND P19-28.
DOES OPEN EXIST?

YES: REFER TO PARA 9-30-1 TO TROUBLESHOOT CPG CAUTION/WARNING PANEL.

YES: REPAIR OPEN WIRE BETWEEN P699-73 AND P19-28.
GO TO PARA 9-32-1.

END OF TASK

9-32-22. PILOT ROCKET INDICATOR - IS NOT LIGHTED WITH RKT SWITCH IN NORM POSITION

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

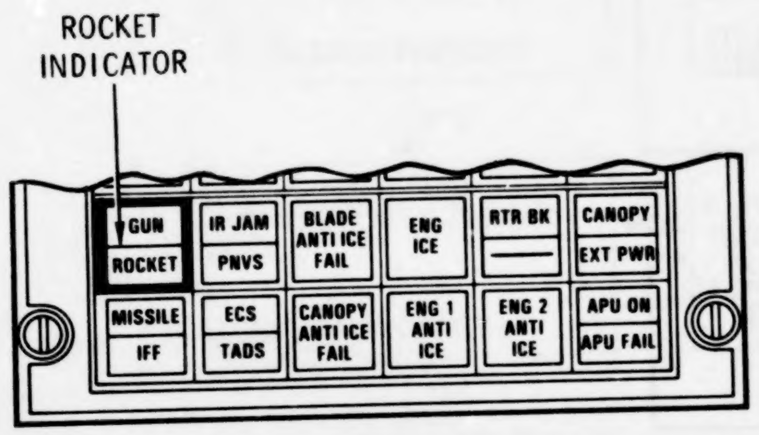
TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

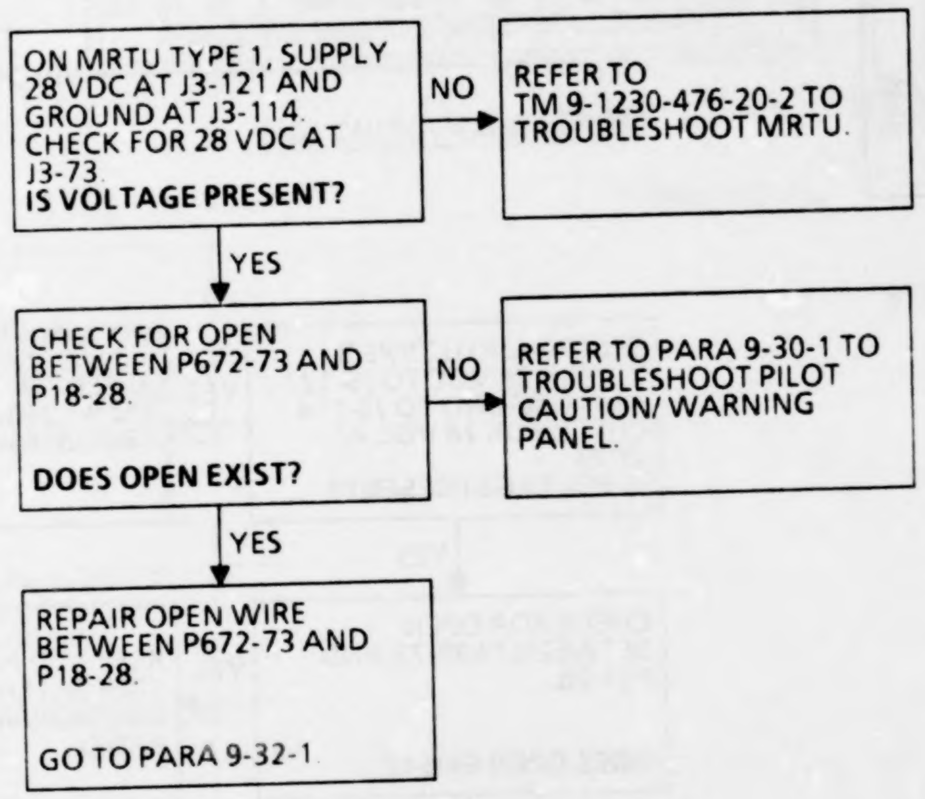
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ROCKET INDICATOR
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

PILOT CAUTION/WARNING PANEL

MM04/1-1179


ON MRTU TYPE 1, SUPPLY 28 VDC AT J3-121 AND GROUND AT J3-114. CHECK FOR 28 VDC AT J3-73. IS VOLTAGE PRESENT?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.
YES
CHECK FOR OPEN BETWEEN P672-73 AND P18-28. DOES OPEN EXIST?
NO
REFER TO PARA 9-30-1 TO TROUBLESHOOT PILOT CAUTION/ WARNING PANEL.
YES
REPAIR OPEN WIRE BETWEEN P672-73 AND P18-28. GO TO PARA 9-32-1

END OF TASK

9-32-23. CPG GUN INDICATOR - IS NOT LIGHTED WITH GUN SWITCH IN NORM POSITION

Tools: (para 9-32-22)

Personnel Required: (para 9-32-22)

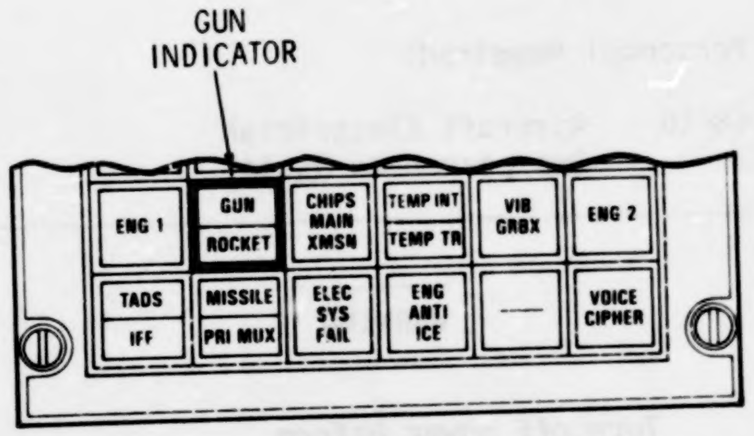
References: (para 9-32-22)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L40 cover removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

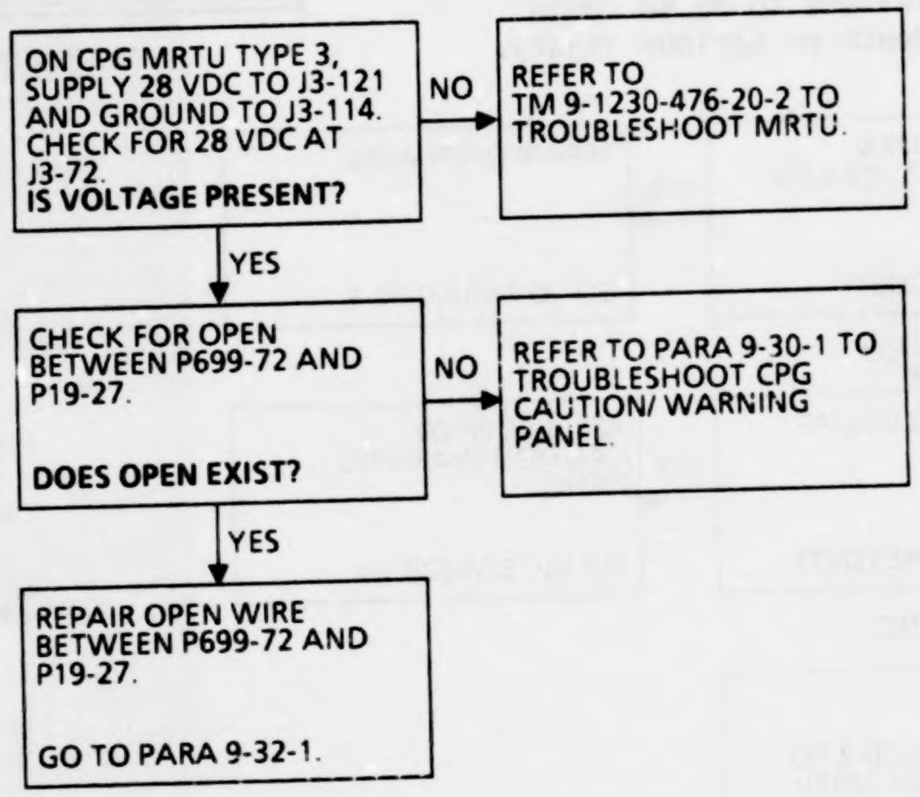
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


GUN INDICATOR
ENG 1
GUN
ROCKET
CHIPS MAIN XMSN
TEMP INT
TEMP TR
VIB GRBX
ENG 2
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
VOICE CIPHER

CPG CAUTION/WARNING PANEL

MM04/1-1158


ON CPG MRTU TYPE 3, SUPPLY 28 VDC TO J3-121 AND GROUND TO J3-114. CHECK FOR 28 VDC AT J3-72. IS VOLTAGE PRESENT?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.
YES
CHECK FOR OPEN BETWEEN P699-72 AND P19-27. DOES OPEN EXIST?
NO
REFER TO PARA 9-30-1 TO TROUBLESHOOT CPG CAUTION/ WARNING PANEL.
YES
REPAIR OPEN WIRE BETWEEN P699-72 AND P19-27. GO TO PARA 9-32-1.

END OF TASK

9-32-24. PILOT GUN INDICATOR - IS NOT LIGHTED WITH GUN SWITCH IN NORM POSITION

Tools: (para 9-32-22)

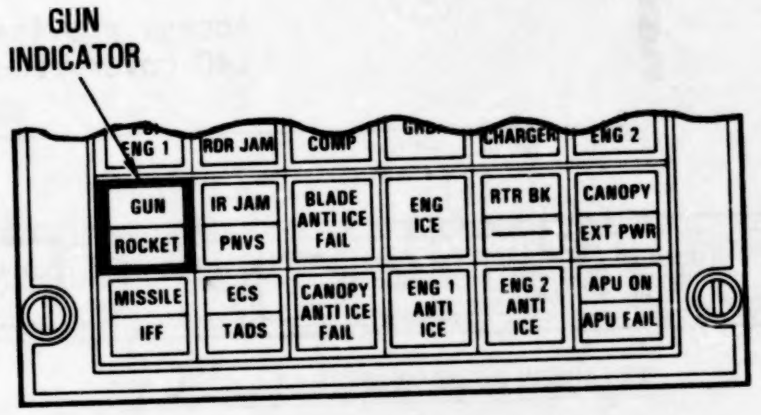
Personnel Required: (para 9-32-22)

References: (para 9-32-22)

Equipment Conditions: (para 9-32-22)

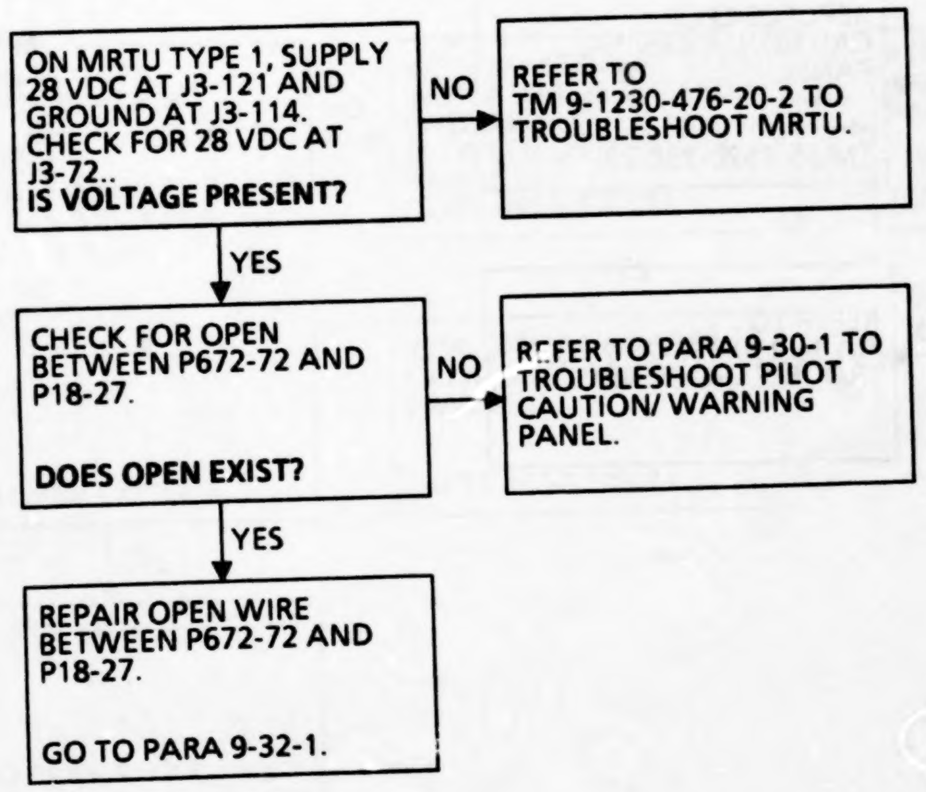
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


GUN INDICATOR
ENG 1
RDR JAM
COMP
GND
CHARGER
ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
—
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

PILOT CAUTION/WARNING PANEL

MM04/1-1180A



ON MRTU TYPE 1, SUPPLY 28 VDC AT J3-121 AND GROUND AT J3-114. CHECK FOR 28 VDC AT J3-72. IS VOLTAGE PRESENT?

NO: REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

YES: CHECK FOR OPEN BETWEEN P672-72 AND P18-27. DOES OPEN EXIST?

NO: REFER TO PARA 9-30-1 TO TROUBLESHOOT PILOT CAUTION/ WARNING PANEL.

YES: REPAIR OPEN WIRE BETWEEN P672-72 AND P18-27. GO TO PARA 9-32-1.

END OF TASK

9-32-25. CPG MISSILE INDICATOR IS NOT LIGHTED WITH MISSILE SWITCH IN ON POSITION

Tools: (para 9-32-22)

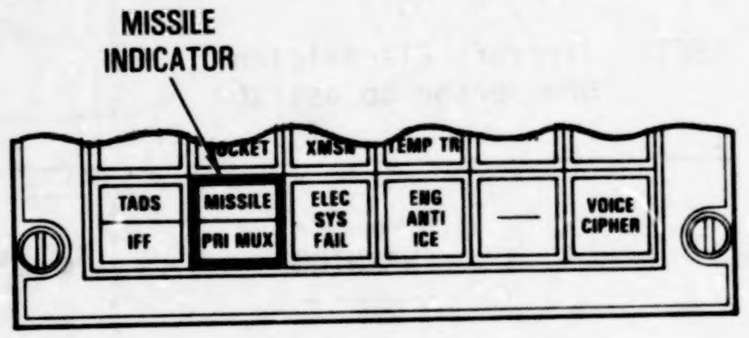
Personnel Required: (para 9-32-22)

References: (para 9-32-22)

Equipment Conditions: (para 9-32-23)

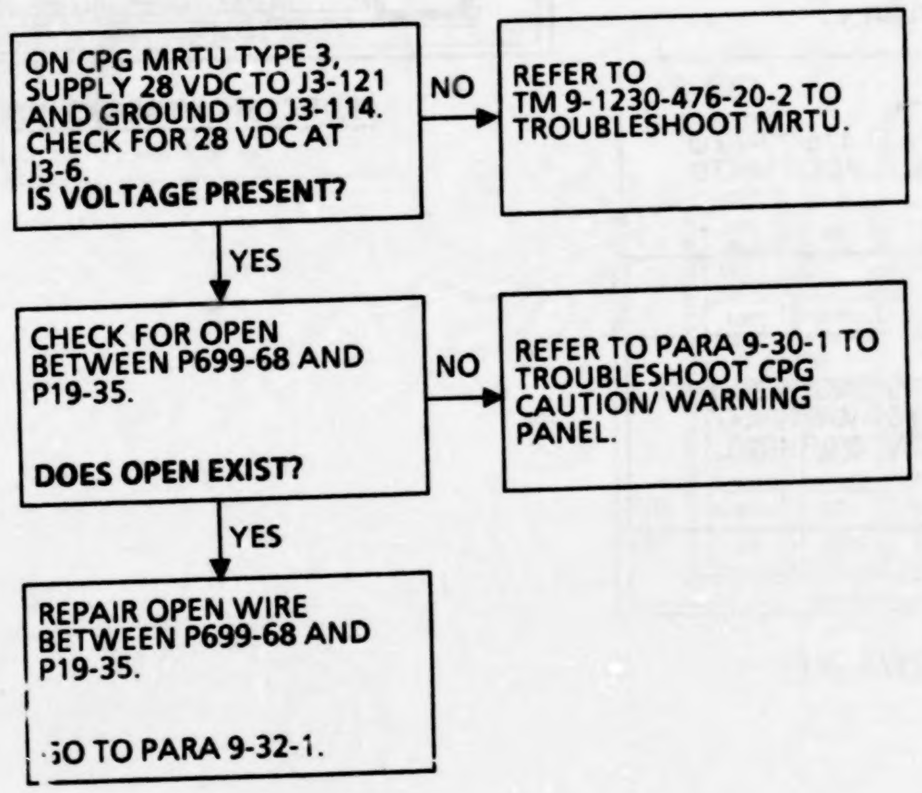
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


MISSILE INDICATOR
ROCKET
XMSN
TEMP TR
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
—
VOICE CIPHER

CPG CAUTION/WARNING PANEL

MM04/1-1159A



ON CPG MRTU TYPE 3, SUPPLY 28 VDC TO J3-121 AND GROUND TO J3-114. CHECK FOR 28 VDC AT J3-6. IS VOLTAGE PRESENT?

NO: REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

YES: CHECK FOR OPEN BETWEEN P699-68 AND P19-35. DOES OPEN EXIST?

NO: REFER TO PARA 9-30-1 TO TROUBLESHOOT CPG CAUTION/ WARNING PANEL.

YES: REPAIR OPEN WIRE BETWEEN P699-68 AND P19-35. GO TO PARA 9-32-1.

END OF TASK

9-32-26. PILOT MISSILE INDICATOR - IS NOT LIGHTED WITH MSL SWITCH IN ON POSITION

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

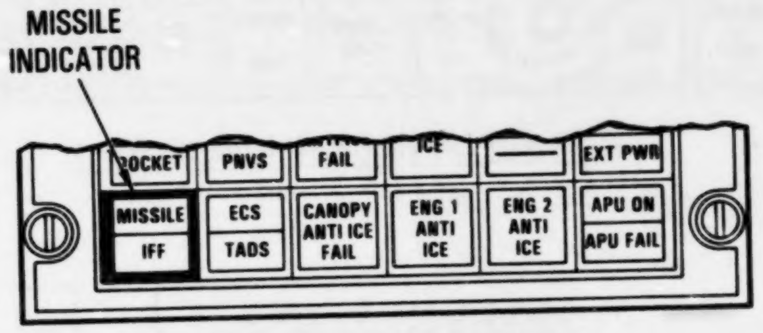
TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

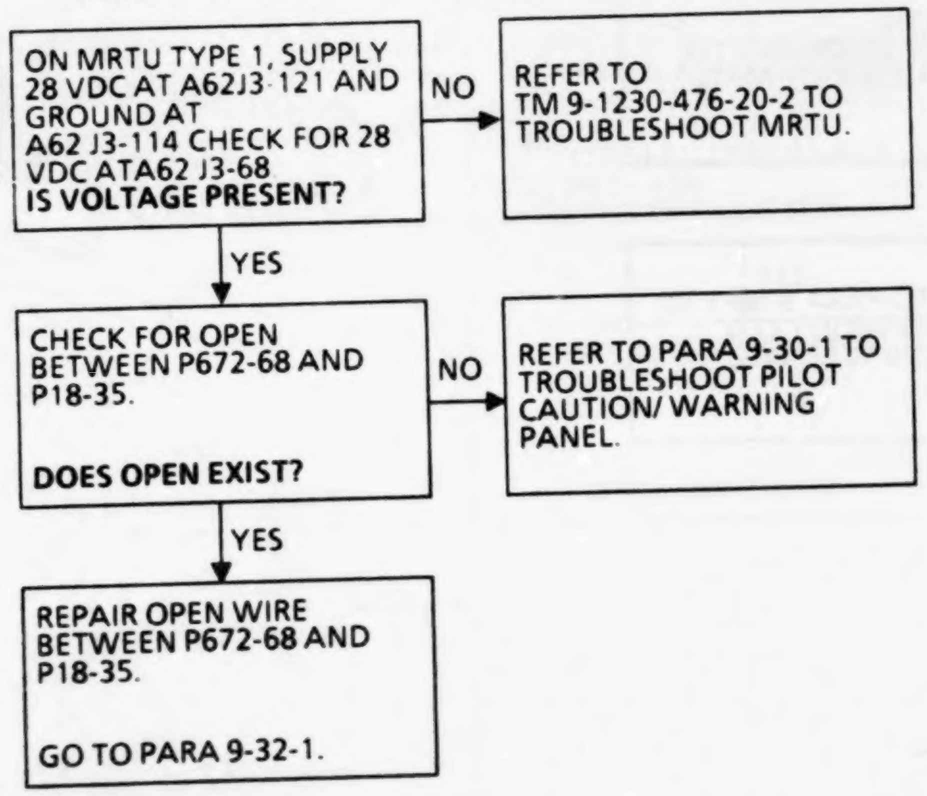
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


MISSILE INDICATOR
ROCKET
PNVS
FAIL
ICE
—
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

PILOT CAUTION/WARNING PANEL

MM04/1-1149A


ON MRTU TYPE 1, SUPPLY 28 VDC AT A62J3-121 AND GROUND AT A62 J3-114 CHECK FOR 28 VDC ATA62 J3-68
IS VOLTAGE PRESENT?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.
YES
CHECK FOR OPEN BETWEEN P672-68 AND P18-35.
DOES OPEN EXIST?
NO
REFER TO PARA 9-30-1 TO TROUBLESHOOT PILOT CAUTION/ WARNING PANEL.
YES
REPAIR OPEN WIRE BETWEEN P672-68 AND P18-35.
GO TO PARA 9-32-1.

END OF TASK

9-32-27. CPG PRI MUX INDICATOR - IS NOT LIGHTED WITH MUX SWITCH IN SEC POSITION

Tools: (para 9-32-26)

Personnel Required: (para 9-32-26)

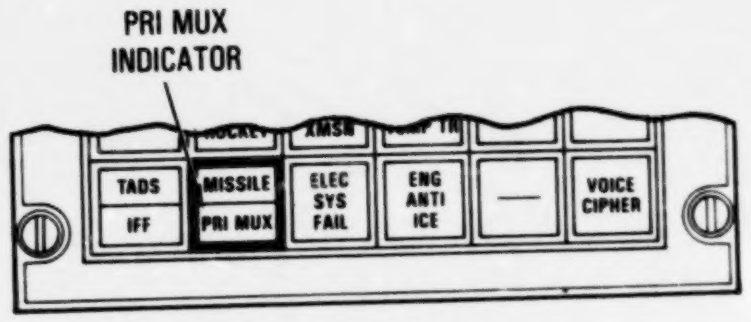
References: (para 9-32-26)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L40 cover removed

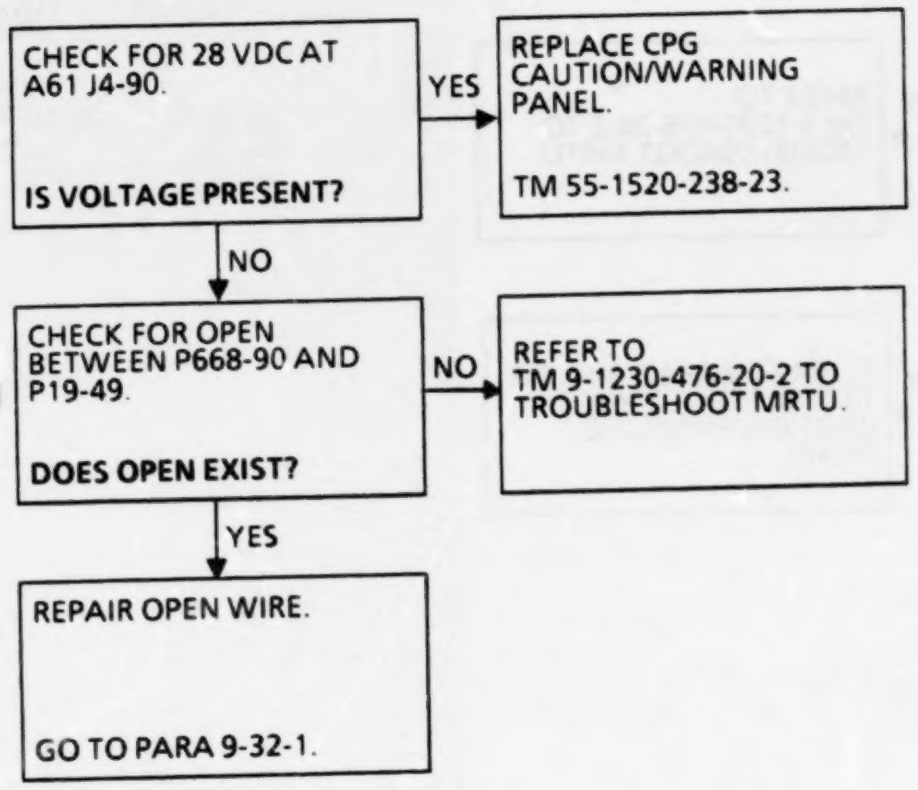
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


PRI MUX INDICATOR
XMSN
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
—
VOICE CIPHER

CPG CAUTION/WARNING PANEL

MM04/1-1160A


CHECK FOR 28 VDC AT A61 J4-90.
IS VOLTAGE PRESENT?
YES
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN P668-90 AND P19-49.
DOES OPEN EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.

END OF TASK

9-32-28. CPG MASTER CAUTION RESET - DOES NOT FUNCTION

Tools: (para 9-32-26)

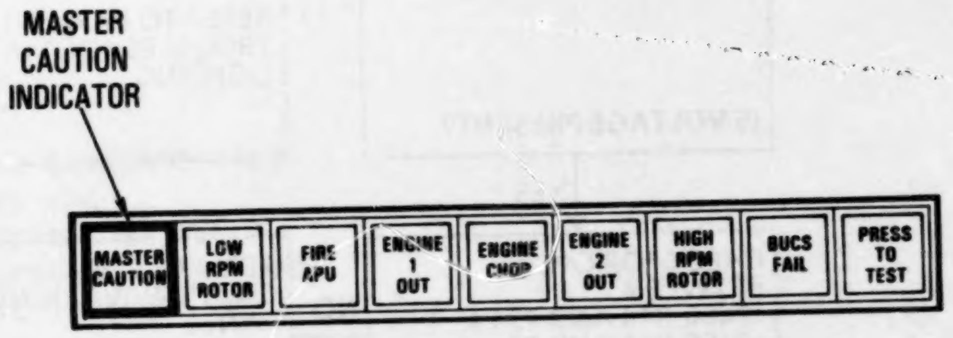
Personnel Required: (para 9-32-26)

References:

TM 55-1520-238-23

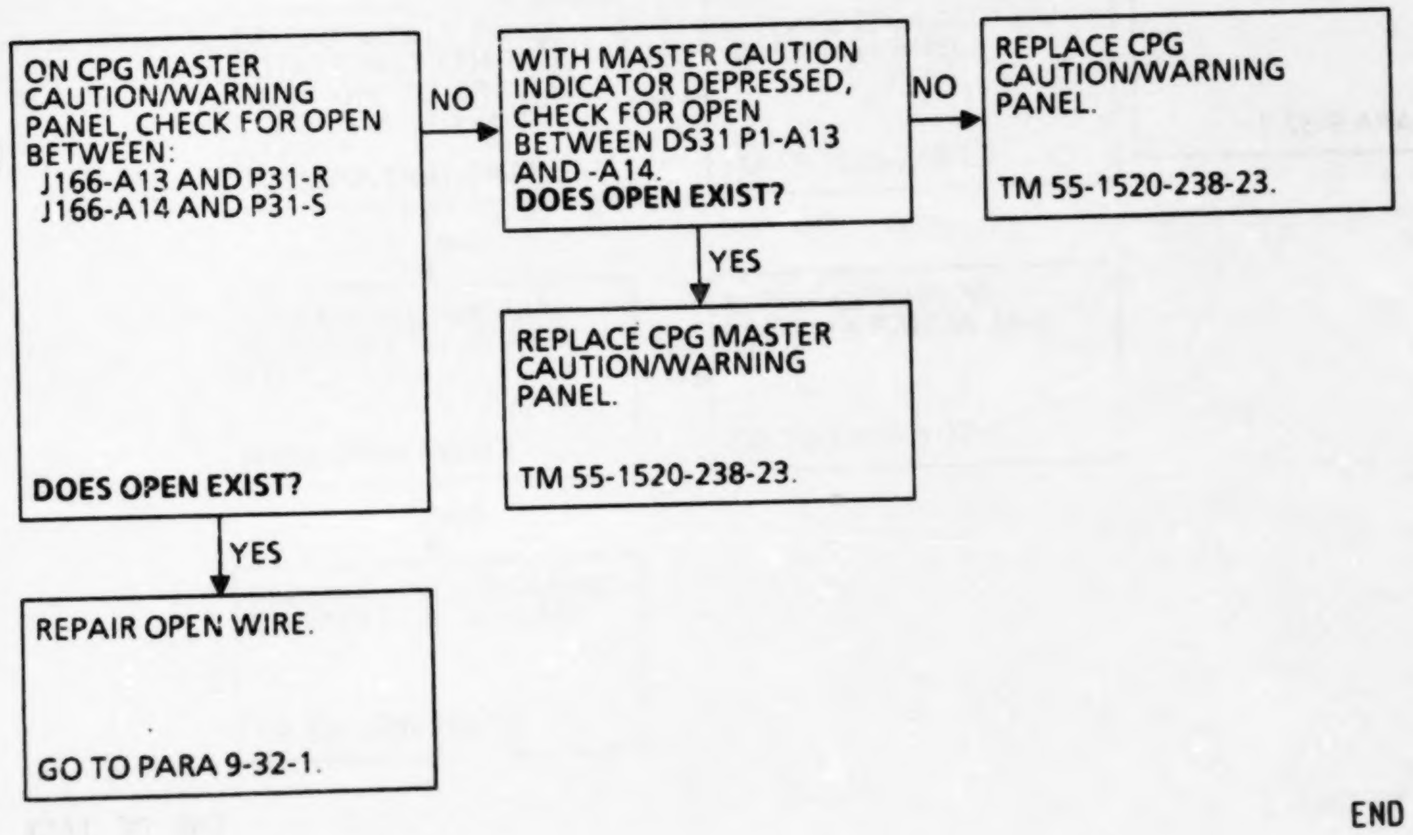
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


MASTER CAUTION INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

CPG MASTER CAUTION/WARNING INDICATOR

MM04/1-1177



ON CPG MASTER CAUTION/WARNING PANEL, CHECK FOR OPEN BETWEEN:
J166-A13 AND P31-R
J166-A14 AND P31-S

DOES OPEN EXIST?

NO

WITH MASTER CAUTION INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS31 P1-A13 AND -A14.
DOES OPEN EXIST?

NO

REPLACE CPG CAUTION/WARNING PANEL.

TM 55-1520-238-23.

YES

REPLACE CPG MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

YES

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

END OF TASK

9-32-29. PILOT PRI MUX INDICATOR - IS NOT LIGHTED WITH MUX SWITCH IN SEC POSITION

Tools: (para 9-32-26)

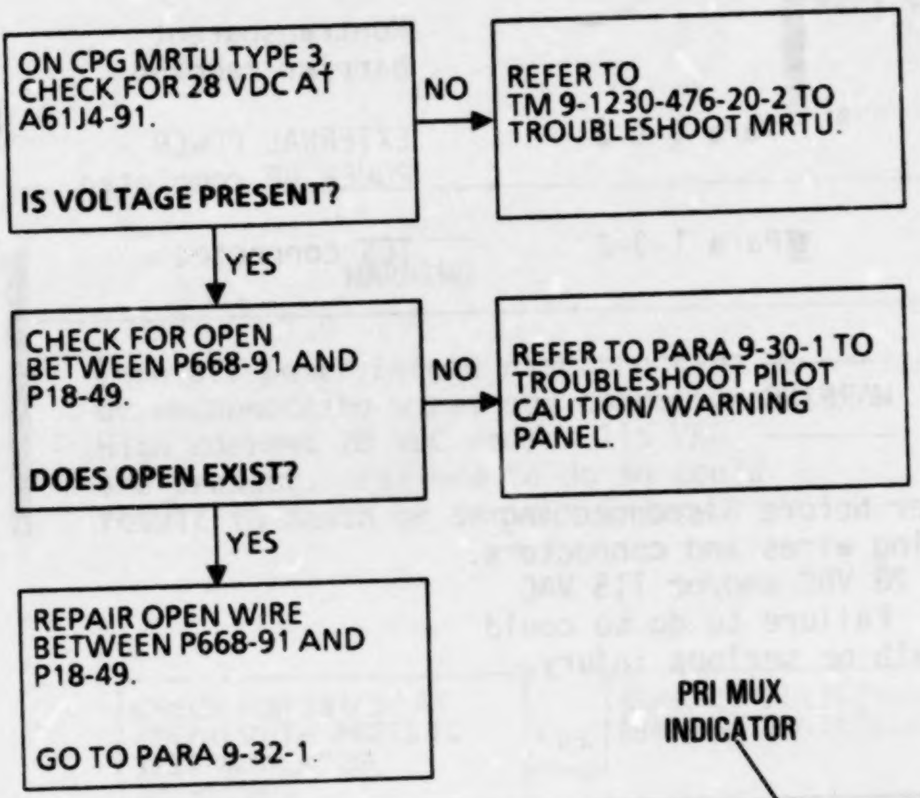
Personnel Required: (para 9-32-26)

References: (para 9-32-26)

Equipment Conditions: (para 9-32-26)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON CPG MRTU TYPE 3, CHECK FOR 28 VDC AT A61J4-91.

IS VOLTAGE PRESENT?

NO

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

YES

CHECK FOR OPEN BETWEEN P668-91 AND P18-49.

DOES OPEN EXIST?

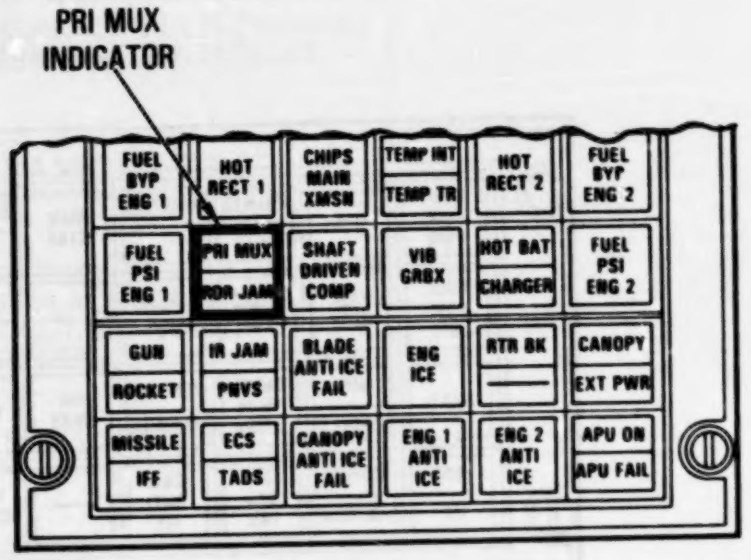
NO

REFER TO PARA 9-30-1 TO TROUBLESHOOT PILOT CAUTION/WARNING PANEL.

YES

REPAIR OPEN WIRE BETWEEN P668-91 AND P18-49.

GO TO PARA 9-32-1.


PRI MUX INDICATOR
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL PSI ENG 1
PRI MUX
RDR JAM
SHAFT DRIVEN COMP
VIB GRBX
HOT BAT
CHARGER
FUEL PSI ENG 2
GUN
ROCKET
IR JAM
PNVS
BLADE ANTI ICE FAIL
ENG ICE
RTR BK
CANOPY
EXT PWR
MISSILE
IFF
ECS
TADS
CANOPY ANTI ICE FAIL
ENG 1 ANTI ICE
ENG 2 ANTI ICE
APU ON
APU FAIL

PILOT CAUTION/WARNING PANEL

MM04/1-1156

END OF TASK

9-32-30. CPG CAUTION/WARNING EDGE-LIGHT PANEL - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

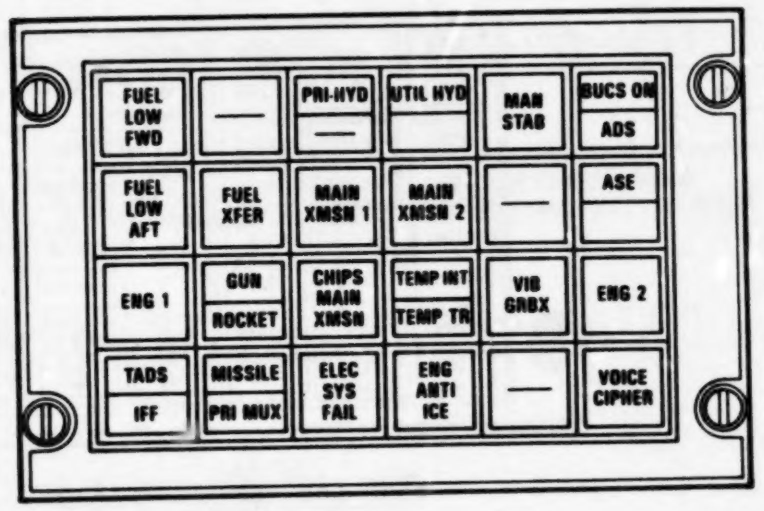
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

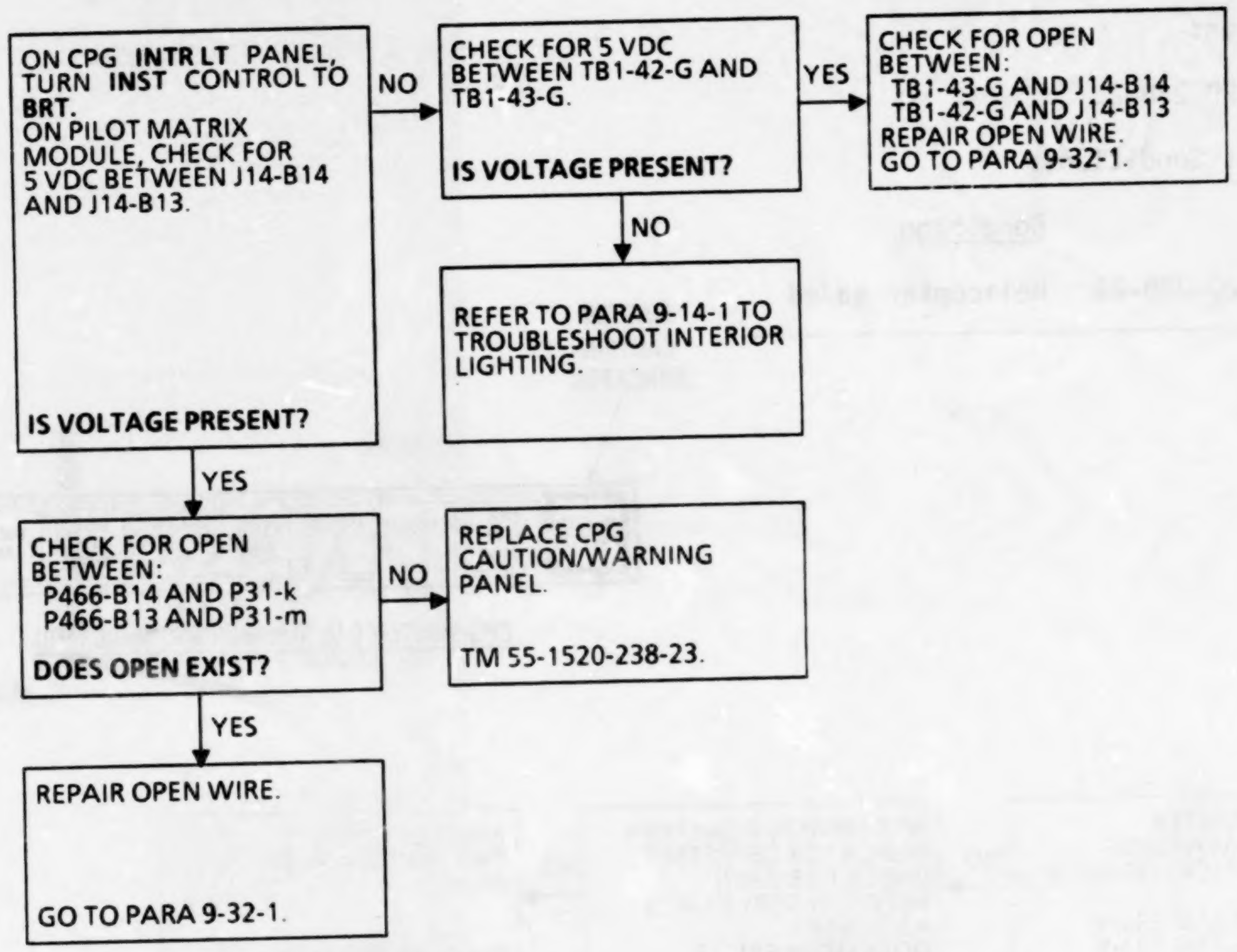
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


FUEL LOW FWD
—
PRI-HYD
—
UTIL HYD
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
FUEL XFER
MAIN XMSN 1
MAIN XMSN 2
—
ASE
ENG 1
GUN
ROCKET
CHIPS MAIN XMSN
TEMP INT
TEMP TR
VIB GRBX
ENG 2
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
—
VOICE CIPHER

CPG CAUTION / WARNING PANEL

MM04/1-1150A


ON CPG INTR LT PANEL, TURN INST CONTROL TO BRT.
ON PILOT MATRIX MODULE, CHECK FOR 5 VDC BETWEEN J14-B14 AND J14-B13.
IS VOLTAGE PRESENT?

NO: CHECK FOR 5 VDC BETWEEN TB1-42-G AND TB1-43-G.
IS VOLTAGE PRESENT?

YES: CHECK FOR OPEN BETWEEN:
TB1-43-G AND J14-B14
TB1-42-G AND J14-B13
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.

NO: REFER TO PARA 9-14-1 TO TROUBLESHOOT INTERIOR LIGHTING.

YES: CHECK FOR OPEN BETWEEN:
P466-B14 AND P31-k
P466-B13 AND P31-m
DOES OPEN EXIST?

NO: REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.

YES: REPAIR OPEN WIRE.
GO TO PARA 9-32-1.

END OF TASK

9-32-31. CPG CAUTION/WARNING INDICATORS - DO NOT INCREASE IN BRIGHTNESS

Tools: (para 9-32-30)

Personnel Required: (para 9-32-30)

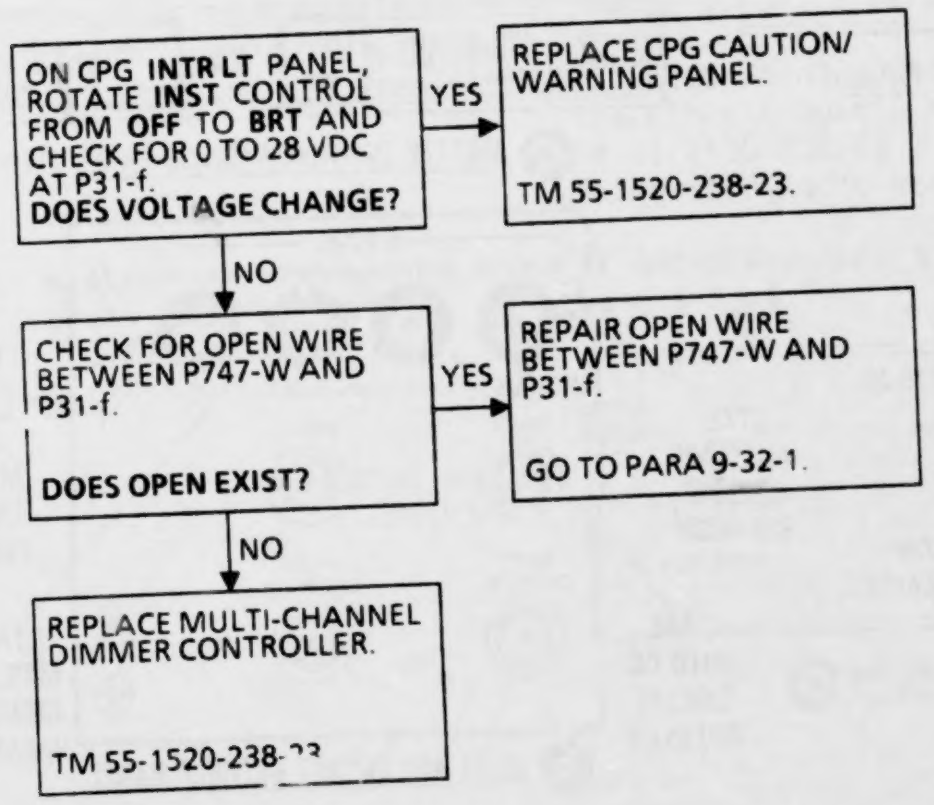
References: (para 9-32-30)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG INTR LT PANEL, ROTATE INST CONTROL FROM OFF TO BRT AND CHECK FOR 0 TO 28 VDC AT P31-f.
DOES VOLTAGE CHANGE?
YES
REPLACE CPG CAUTION/ WARNING PANEL.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN P747-W AND P31-f.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN P747-W AND P31-f.
GO TO PARA 9-32-1.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROLLER.
TM 55-1520-238-23

END OF TASK

9-32-32. CPG ARM/SAFE, FIRE PULL ENG 1 AND 2 INDICATORS - ARE NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-30)

Personnel Required: (para 9-32-30)

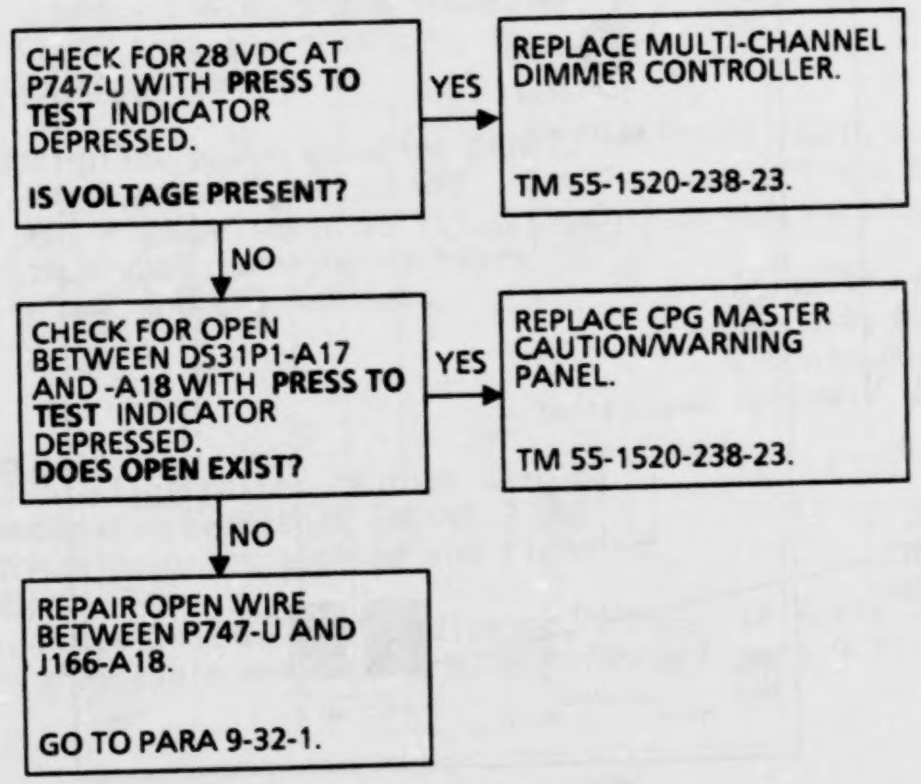
References: (para 9-32-30)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Access provisions L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT P747-U WITH PRESS TO TEST INDICATOR DEPRESSED.
IS VOLTAGE PRESENT?
YES
REPLACE MULTI-CHANNEL DIMMER CONTROLLER.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN DS31P1-A17 AND -A18 WITH PRESS TO TEST INDICATOR DEPRESSED.
DOES OPEN EXIST?
YES
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPAIR OPEN WIRE BETWEEN P747-U AND J166-A18.
GO TO PARA 9-32-1.

END OF TASK

9-33-1. AUDIO WARNING SYSTEM - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Headset (2)	5965-00-755-4656

Personnel Required:

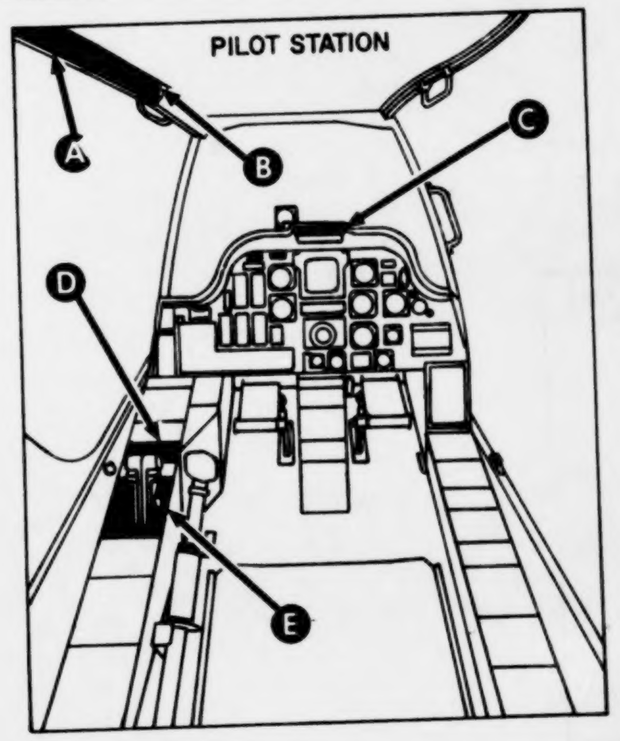
68F10 Aircraft Electrician
One person to assist

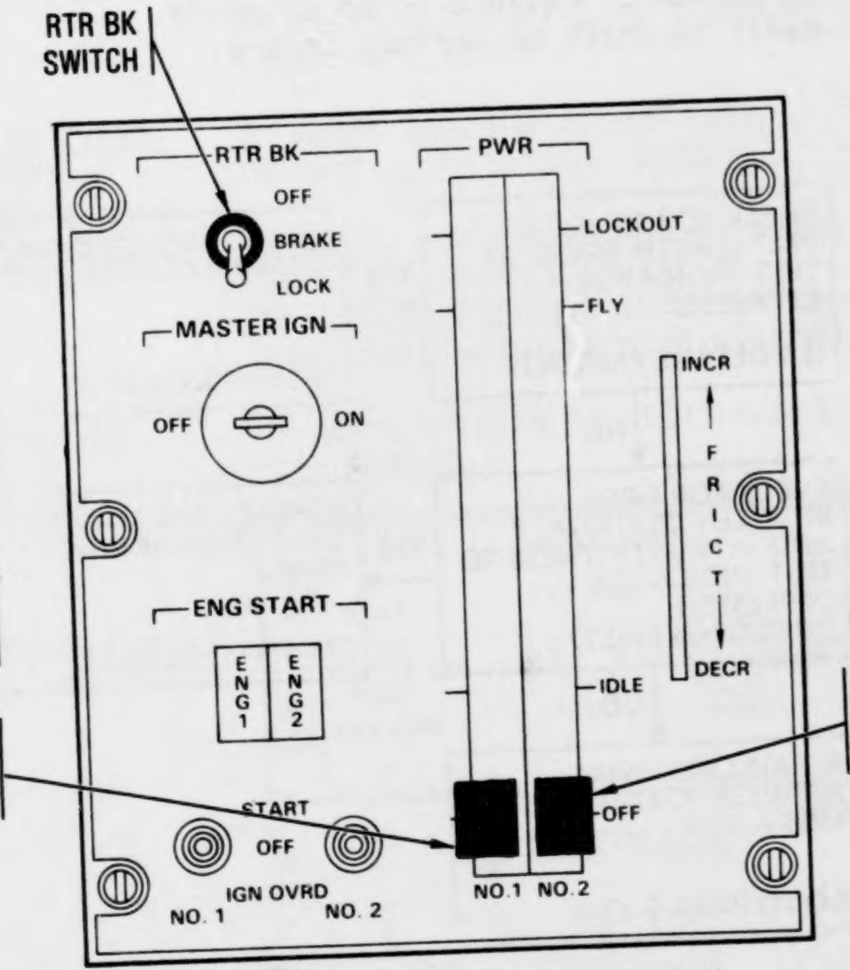
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

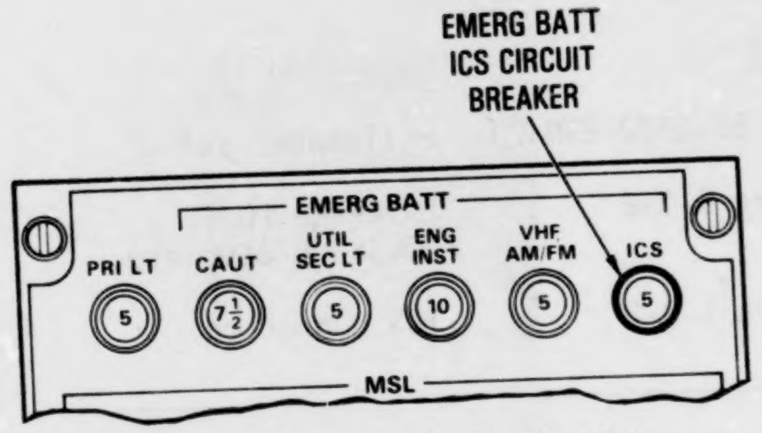
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
TM 11-1520-238-23-2	ICS operational check completed
Para 9-31-1	PILOT CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK completed
Para 9-32-1	CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK completed

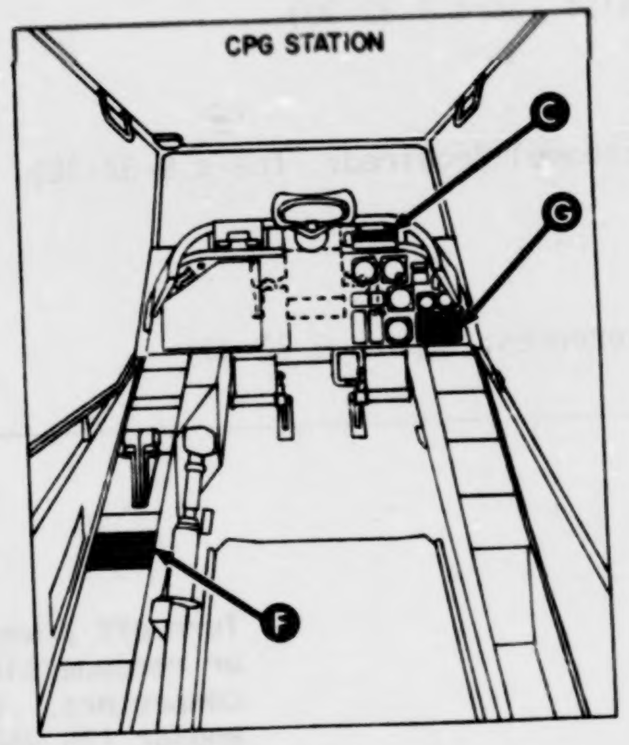

PILOT STATION
A
B
C
D
E

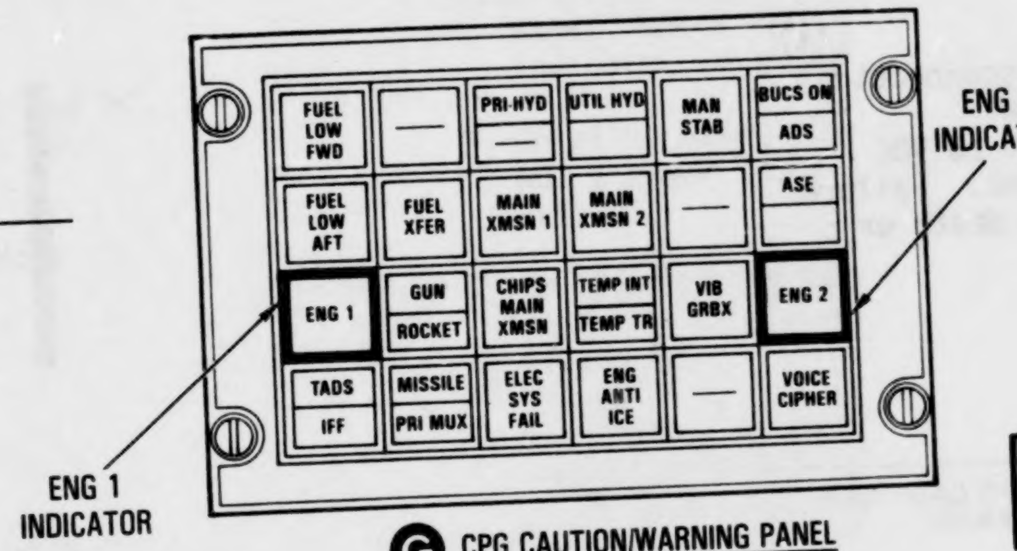

RTR BK SWITCH
RTR BK
OFF
BRAKE
LOCK
MASTER IGN
OFF
ON
ENG START
ENG 1
ENG 2
PWR
LOCKOUT
FLY
INCR
FRICT
DECR
IDLE
OFF
START
OFF
IGN OVRD
NO. 1
NO. 2
NO.1
NO.2
NO 1 POWER LEVER
NO 2 POWER LEVER

E PILOT POWER QUADRANT PANEL

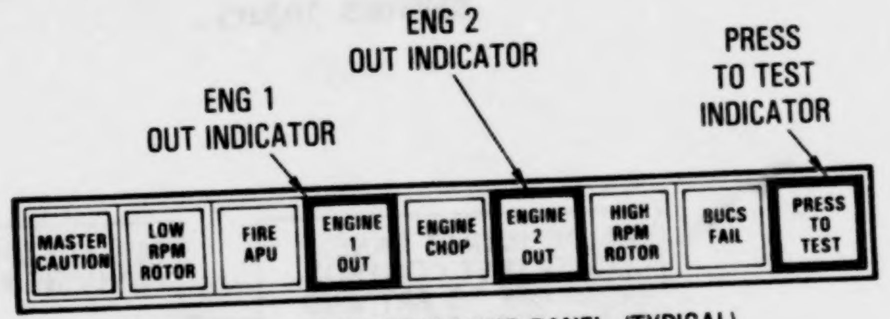

EMERG BATT ICS CIRCUIT BREAKER
EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5
MSL

F CPG CIRCUIT BREAKER PANEL NO.1

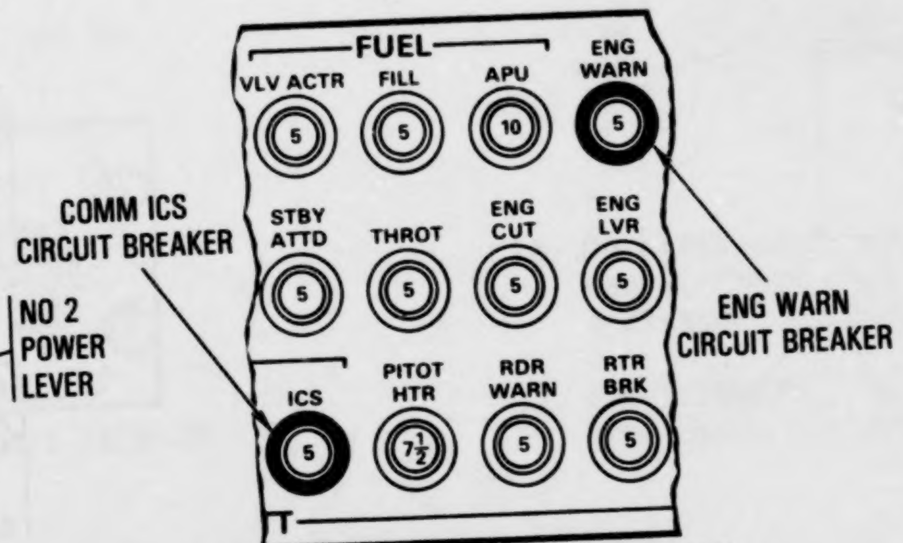

CPG STATION
C
G
F


FUEL LOW FWD
PRI-HYD
UTIL HYD
MAN STAB
BUCS ON
ADS
FUEL LOW AFT
FUEL XFER
MAIN XMSN 1
MAIN XMSN 2
ASE
ENG 1
GUN
ROCKET
CHIPS MAIN XMSN
TEMP INT
TEMP TR
VIB GRBX
ENG 2
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
VOICE CIPHER
ENG 2 INDICATOR
ENG 1 INDICATOR

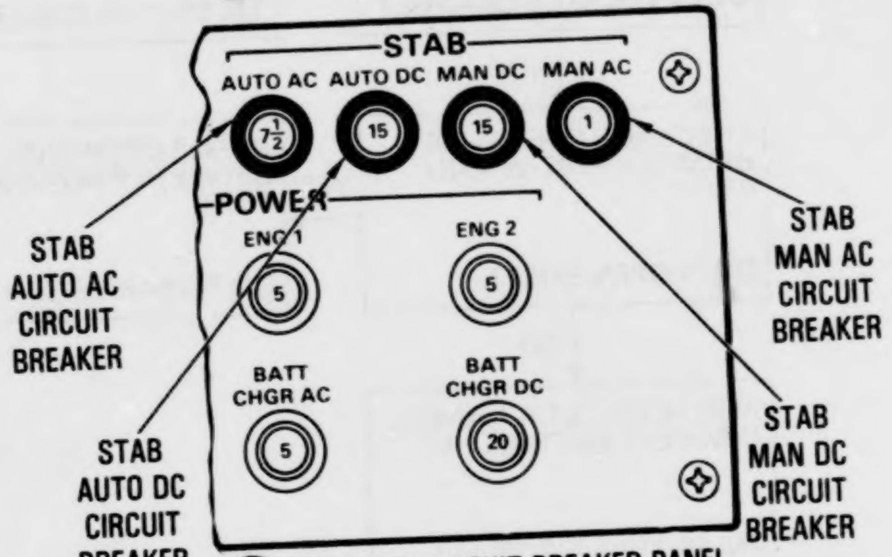
G CPG CAUTION/WARNING PANEL


ENG 1 OUT INDICATOR
ENG 2 OUT INDICATOR
PRESS TO TEST INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

C MASTER CAUTION/WARNING PANEL (TYPICAL)


COMM ICS CIRCUIT BREAKER
FUEL
VLV ACTR
FILL
APU
ENG WARN
5
5
10
5
STBY ATTD
THROT
ENG CUT
ENG LVR
5
5
5
5
ICS
PITOT HTR
RDR WARN
RTR BRK
5
7½
5
5
T
ENG WARN CIRCUIT BREAKER

B PILOT CENTER CIRCUIT BREAKER PANEL


STAB
AUTO AC
AUTO DC
MAN DC
MAN AC
7½
15
15
1
POWER
ENG 1
ENG 2
5
5
BATT CHGR AC
BATT CHGR DC
5
20
STAB AUTO AC CIRCUIT BREAKER
STAB AUTO DC CIRCUIT BREAKER
STAB MAN AC CIRCUIT BREAKER
STAB MAN DC CIRCUIT BREAKER

A PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1030-1B

GO TO NEXT PAGE

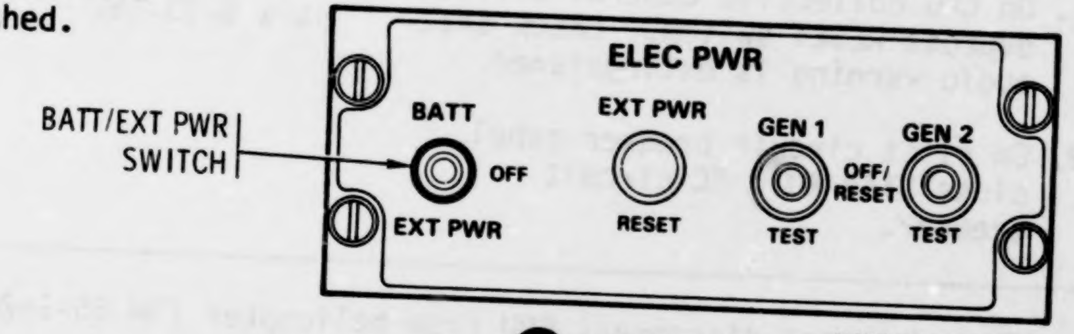
9-33-1. AUDIO WARNING SYSTEM - OPERATIONAL CHECK (cont)

NOTE

If a false engine out warning occurs for an operating engine, during an inflight single engine maneuver requiring high power settings resulting in the engine **Np** (power turbine speed) dropping below 89%, go to para 9-33-17.

A. Perform operational check as follows:

TASK	RESULT
1. On pilot circuit breaker panel, check that **ENG WARN**, **COMM ICS**, **STAB AUTO AC**, **STAB AUTO DC**, **STAB MAN DC**, and **STAB MAN AC** circuit breakers are closed.	If **ENG WARN** circuit breaker does not stay closed, go to para 9-33-4. If **COMM ICS** circuit breaker does not stay closed, refer to TM 11-1520-238-23-2 to troubleshoot intercom system. If **STAB AUTO AC**, **STAB AUTO DC**, **STAB MAN DC**, and **STAB MAN AC** circuit breakers do not stay closed, go to Chapter 11.
2. On CPG circuit breaker panel No. 1, check that **EMERG BATT ICS** circuit breaker is closed.	If **EMERG BATT ICS** circuit breaker does not stay closed, refer to TM 11-1520-238-23-2 to troubleshoot intercom system.
3. On **ELEC PWR** panel, cycle **BATT/EXT PWR** switch to **OFF**, and back to **EXT PWR**. Check that audio warning is heard in pilot and CPG headsets.	If audio warning is not heard in both headsets, go to para 9-33-5. If audio warning is heard in one but not the other headset, refer to TM 11-1520-238-23-2 to troubleshoot integrated audio warning system.
4. On pilot master caution/warning panel, depress **ENGINE 1 OUT** indicator. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-6.

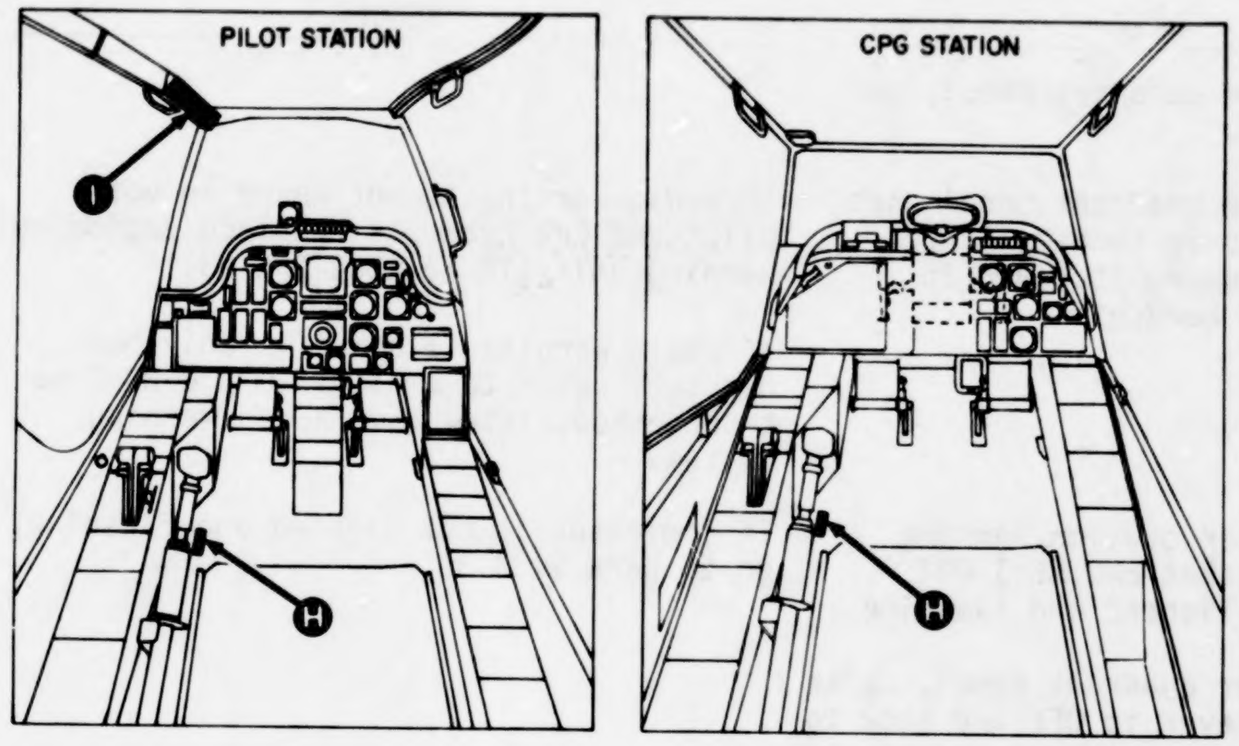


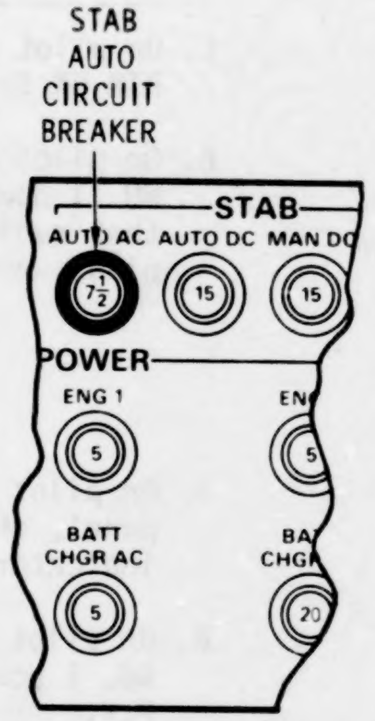
D ELEC PWR PANEL   MM04/1-1030-2A

TASK	RESULT
5. On pilot power quadrant panel, set **RTR BK** to **OFF**.	
6. On pilot power quadrant panel, set **NO. 1** power lever to **FLY**. Check that audio warning is heard in pilot and CPG headsets.	If audio warning is not heard in both pilot and CPG headsets, replace engine out warning unit (TM 55-1520-238-23). If audio warning is heard in only one headset, refer to TM 11-1520-238-23-2 to troubleshoot integrated audio warning system.
7. On pilot master caution/warning panel, check that **ENGINE 1 OUT** indicator is lighted and flashing.	If indicator is not lighted and flashing, go to para 9-33-8.
8. On pilot power quadrant panel, cycle **NO. 1** power lever to **OFF** and back to **FLY**.	
9. On CPG caution/warning panel, check that **ENG 1** indicator is lighted and flashing.	If indicator is not lighted and flashing, go to para 9-33-7.
10. On CPG master caution/warning panel, depress **ENGINE 1 OUT** indicator. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-9.
11. On pilot power quadrant panel, set **NO. 1** power lever to **OFF**. Set **NO. 2** power lever to **FLY**. Check that audio warning is heard in pilot and CPG headsets.	If audio warning is not heard in both pilot and CPG headsets, replace engine out warning unit (TM 55-1520-238-23). If audio warning is heard in only one headset, refer to TM 11-1520-238-23-2 to troubleshoot integrated audio warning system.
12. On pilot master caution warning panel, check that **ENGINE 2 OUT** indicator is lighted and flashing.	If indicator is not lighted and flashing, go to para 9-33-10.
13. Press **ENGINE 2 OUT** indicator, check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-11.

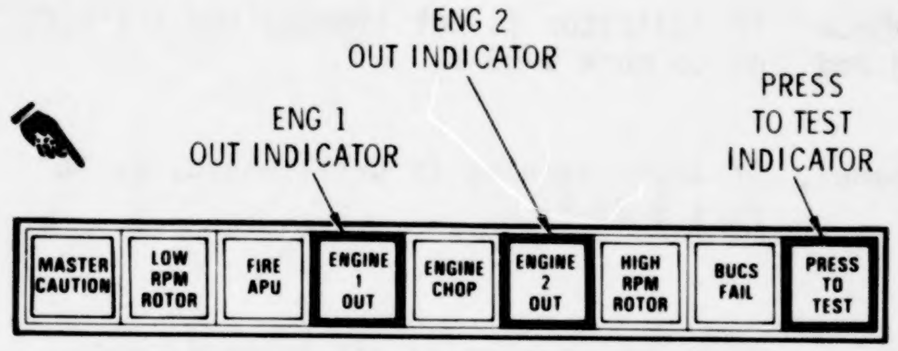
GO TO NEXT PAGE

9-33-1. AUDIO WARNING SYSTEM - OPERATIONAL CHECK (cont)

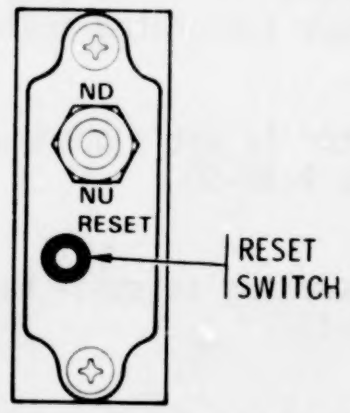

PILOT STATION
CPG STATION
I
H


STAB AUTO CIRCUIT BREAKER
STAB
AUTO AC
AUTO DC
MAN DC
7½
15
15
POWER
ENG 1
5
BATT CHGR AC
5
20

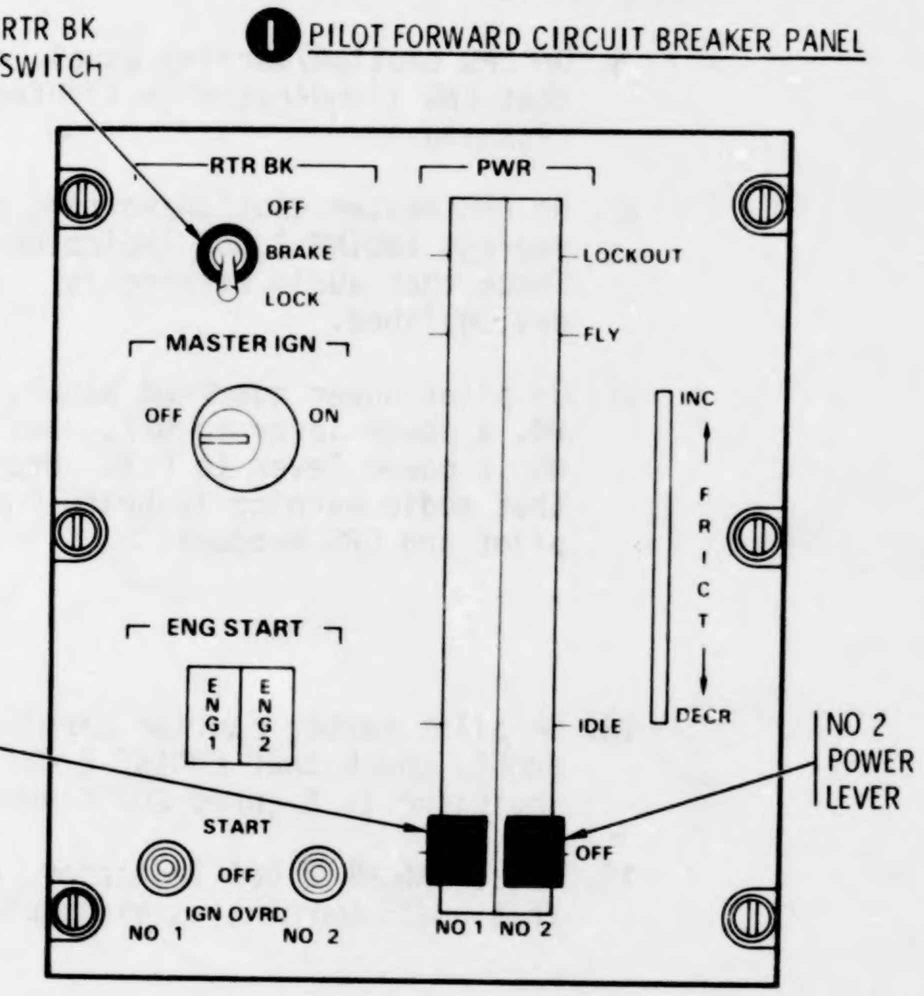
I PILOT FORWARD CIRCUIT BREAKER PANEL


ENG 2 OUT INDICATOR
ENG 1 OUT INDICATOR
PRESS TO TEST INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

MASTER CAUTION/WARNING PANEL (TYPICAL)


ND
NU
RESET
RESET SWITCH

H COLLECTIVE STICK STABILATOR MANUAL CONTROL SWITCH PANEL (TYPICAL)


RTR BK SWITCH
RTR BK
OFF
BRAKE
LOCK
PWR
LOCKOUT
FLY
MASTER IGN
OFF
ON
INC
FRICT
DECR
ENG START
ENG 1
ENG 2
IDLE
START
OFF
IGN OVRD
NO 1
NO 2
OFF
NO 1
NO 2
NO 1 POWER LEVER
NO 2 POWER LEVER

PILOT POWER QUADRANT PANEL

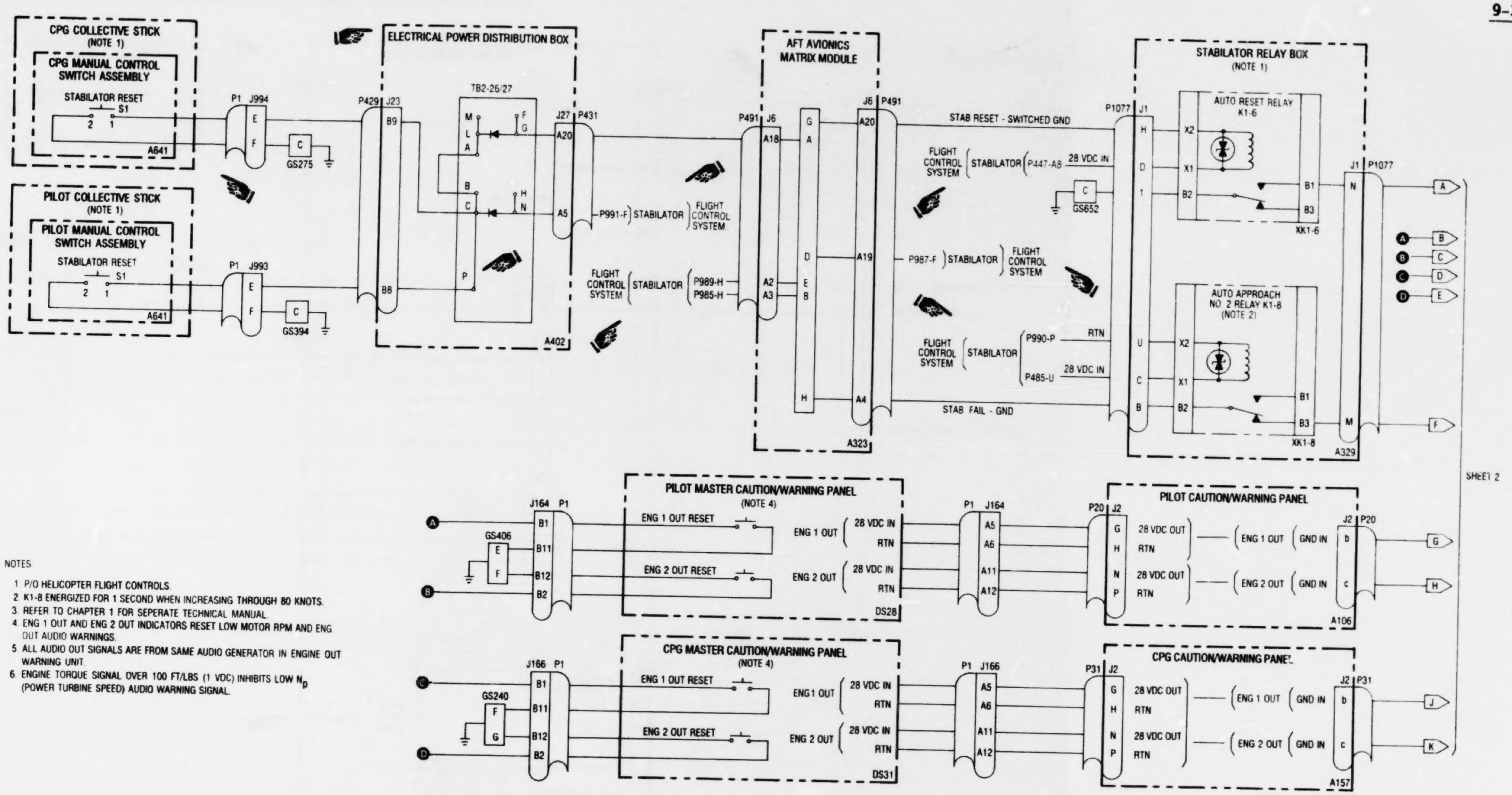
MM04/1-1030-3B

TASK	RESULT
14. On pilot power quadrant panel, cycle **NO. 2** power lever to **OFF** and back to **FLY**.	
15. On CPG caution/warning panel, check that **ENG 2** indicator is lighted and flashing.	If indicator is not lighted and flashing, go to para 9-33-12.
16. On CPG master caution/warning panel, press **ENGINE 2 OUT** indicator. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-13.
17. On pilot power quadrant panel, set **NO. 2** power lever to **OFF** position, and **RTR BK** to **LOCK** position.	
18. On pilot circuit breaker panel, open **STAB AUTO AC** circuit breaker. Check that audio warning is heard in pilot and CPG headsets.	If audio warning is not heard in both headsets, go to para 9-33-14. If audio warning is heard in one but not the other headset, refer to TM 11-1520-238-23-2 to troubleshoot integrated audio warning system.
19. On pilot collective control stick, depress **RESET** switch. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-15.
20. On pilot circuit breaker panel, cycle **STAB AUTO AC** circuit breaker to closed, and back to open position.	
21. On CPG collective control stick, depress **RESET** switch. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-16.
22. On pilot circuit breaker panel, close **STAB AUTO AC** circuit breaker.	

B. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-33-2. AUDIO WARNING SYSTEM - INTERCONNECTION DIAGRAM

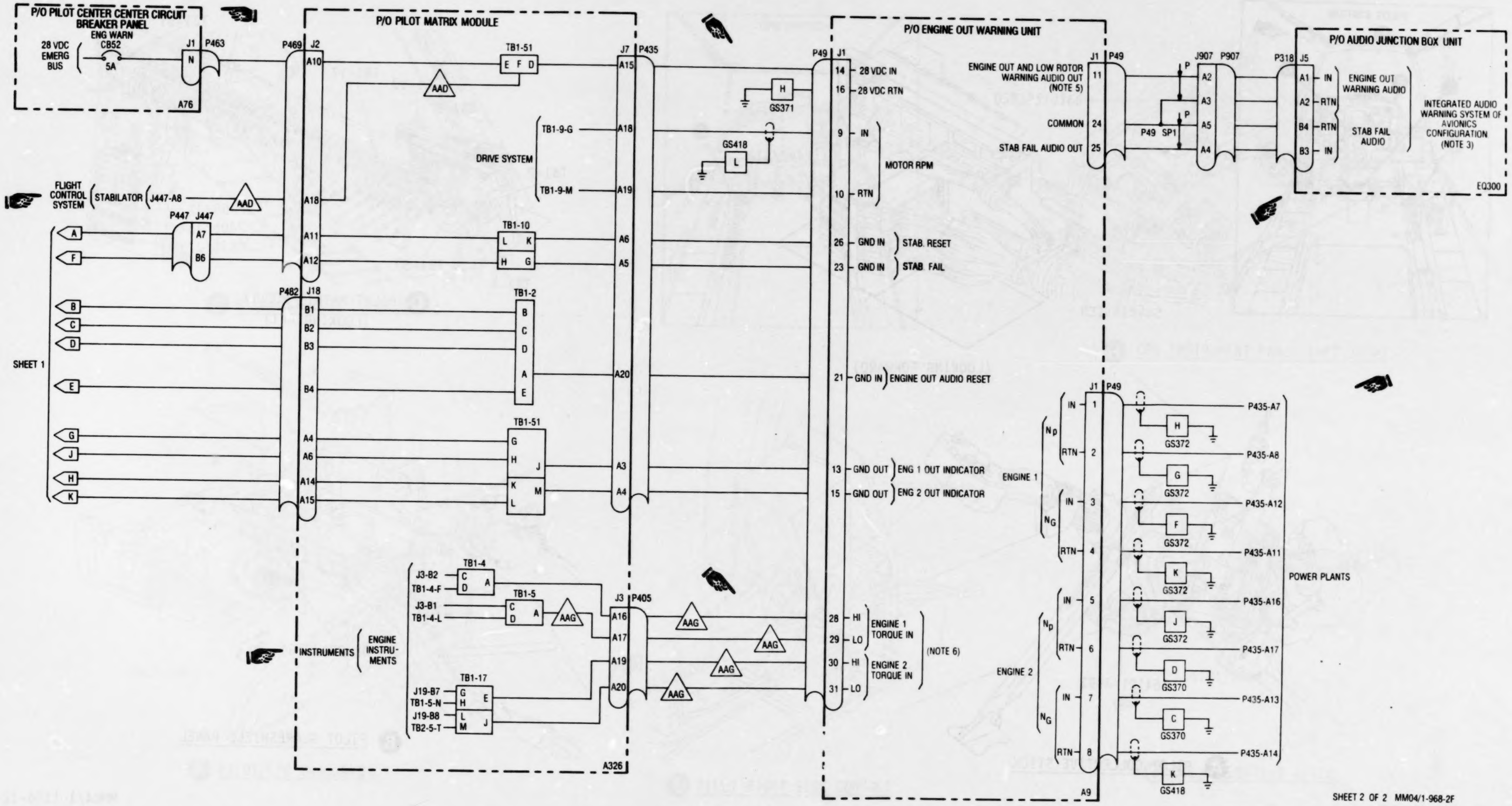

CPG COLLECTIVE STICK
(NOTE 1)
CPG MANUAL CONTROL SWITCH ASSEMBLY
STABILATOR RESET
S1
2 1
A641
P1 J994
E
F
C
GS275
PILOT COLLECTIVE STICK
(NOTE 1)
PILOT MANUAL CONTROL SWITCH ASSEMBLY
STABILATOR RESET
S1
2 1
A641
P1 J993
E
F
C
GS394
ELECTRICAL POWER DISTRIBUTION BOX
P429 J23
B9
B8
TB2-26/27
M L A F G
B C H N
P
J27 P431
A20
A5
A402
P991-F STABILATOR FLIGHT CONTROL SYSTEM
FLIGHT CONTROL SYSTEM STABILATOR P989-H P985-H
AFT AVIONICS MATRIX MODULE
P491 J6
A18
A2
A3
G
A
D
E
B
H
J6 P491
A20
A19
A4
A323
STAB RESET - SWITCHED GND
FLIGHT CONTROL SYSTEM STABILATOR P447-A8 28 VDC IN
C
GS652
P987-F STABILATOR FLIGHT CONTROL SYSTEM
FLIGHT CONTROL SYSTEM STABILATOR P990-P RTN
P485-U 28 VDC IN
STAB FAIL - GND
STABILATOR RELAY BOX
(NOTE 1)
P1077 J1
H
D
T
U
C
B
AUTO RESET RELAY K1-6
X2
X1
B2
B1
B3
XK1-6
AUTO APPROACH NO. 2 RELAY K1-8
(NOTE 2)
X2
X1
B2
B1
B3
XK1-8
J1 P1077
N
M
A329
A
A B
B C
C D
D E
F
SHEET 2
PILOT MASTER CAUTION/WARNING PANEL
(NOTE 4)
J164 P1
B1
B11
B12
B2
GS406
E
F
A
B
ENG 1 OUT RESET
ENG 2 OUT RESET
ENG 1 OUT 28 VDC IN RTN
ENG 2 OUT 28 VDC IN RTN
DS28
P1 J164
A5
A6
A11
A12
PILOT CAUTION/WARNING PANEL
P20 J2
G
H
N
P
28 VDC OUT RTN
28 VDC OUT RTN
ENG 1 OUT GND IN
ENG 2 OUT GND IN
J2 P20
b
c
A106
G
H
CPG MASTER CAUTION/WARNING PANEL
(NOTE 4)
J166 P1
B1
B11
B12
B2
GS240
F
G
C
D
ENG 1 OUT RESET
ENG 2 OUT RESET
ENG1 OUT 28 VDC IN RTN
ENG 2 OUT 28 VDC IN RTN
DS31
P1 J166
A5
A6
A11
A12
CPG CAUTION/WARNING PANEL
P31 J2
G
H
N
P
28 VDC OUT RTN
28 VDC OUT RTN
ENG 1 OUT GND IN
ENG 2 OUT GND IN
J2 P31
b
c
A157
J
K

NOTES

1. P/O HELICOPTER FLIGHT CONTROLS.
2. K1-8 ENERGIZED FOR 1 SECOND WHEN INCREASING THROUGH 80 KNOTS.
3. REFER TO CHAPTER 1 FOR SEPERATE TECHNICAL MANUAL.
4. ENG 1 OUT AND ENG 2 OUT INDICATORS RESET LOW MOTOR RPM AND ENG OUT AUDIO WARNINGS.
5. ALL AUDIO OUT SIGNALS ARE FROM SAME AUDIO GENERATOR IN ENGINE OUT WARNING UNIT.
6. ENGINE TORQUE SIGNAL OVER 100 FT/LBS (1 VDC) INHIBITS LOW N_p (POWER TURBINE SPEED) AUDIO WARNING SIGNAL.

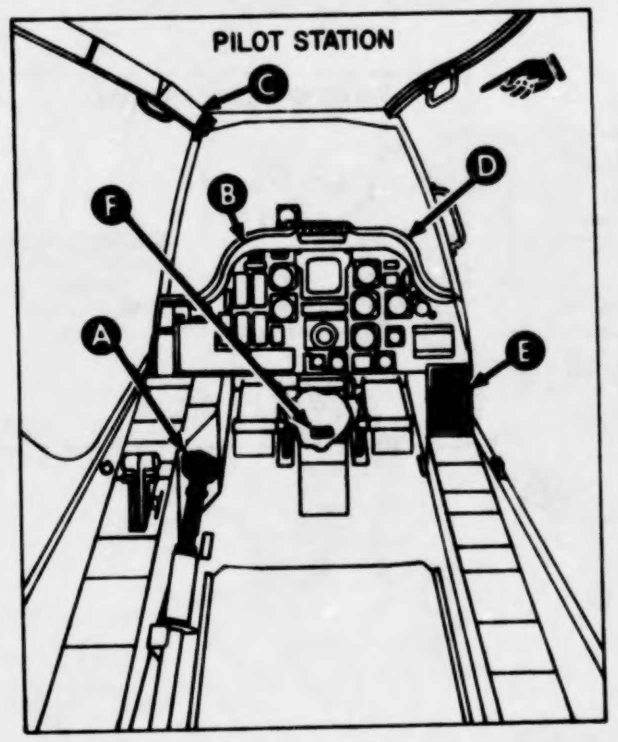
SHEET 1 OF 2 MM04/1-968-1C

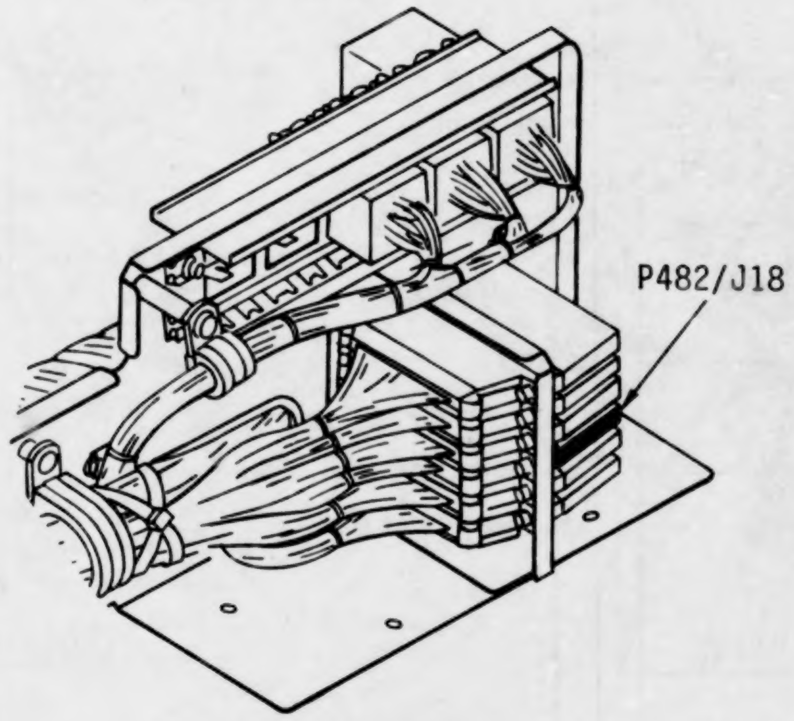
9-33-2. AUDIO WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)


P/O PILOT CENTER CENTER CIRCUIT BREAKER PANEL
28 VDC EMERG BUS
ENG WARN CB52
5A
J1
P463
N
A76
P/O PILOT MATRIX MODULE
P469
J2
A10
A18
A11
A12
TB1-51
E F D
AAD
J7
P435
A15
TB1-9-G
A18
DRIVE SYSTEM
TB1-9-M
A19
FLIGHT CONTROL SYSTEM
STABILATOR
J447-A8
AAD
P447
J447
A7
B6
A
F
TB1-10
L K
H G
A6
A5
P482
J18
B1
B2
B3
B4
B
C
D
E
SHEET 1
TB1-2
B C D A E
A20
G
J
H
K
A4
A6
A14
A15
TB1-51
G H J K M L
A3
A4
TB1-4
J3-B2
TB1-4-F
C D A
TB1-5
J3-B1
TB1-4-L
C D A
AAG
INSTRUMENTS
ENGINE INSTRU-MENTS
TB1-17
J19-B7
TB1-5-N
J19-B8
TB2-5-T
G H E L M J
J3
P405
A16
A17
A19
A20
AAG
AAG
AAG
AAG
A326
H
GS371
GS418
L
P/O ENGINE OUT WARNING UNIT
P49
J1
14 28 VDC IN
16 28 VDC RTN
9 IN
10 RTN
MOTOR RPM
26 GND IN
STAB. RESET
23 GND IN
STAB. FAIL
21 GND IN
ENGINE OUT AUDIO RESET
13 GND OUT
ENG 1 OUT INDICATOR
15 GND OUT
ENG 2 OUT INDICATOR
28 HI
29 LO
ENGINE 1 TORQUE IN
30 HI
31 LO
ENGINE 2 TORQUE IN
(NOTE 6)
A9
ENGINE OUT AND LOW ROTOR WARNING AUDIO OUT (NOTE 5)
COMMON
STAB FAIL AUDIO OUT
J1
P49
11
24
25
P
P
P49 SP1
J907
P907
A2
A3
A5
A4
P/O AUDIO JUNCTION BOX UNIT
P318
J5
A1 IN
A2 RTN
B4 RTN
B3 IN
ENGINE OUT WARNING AUDIO
STAB FAIL AUDIO
INTEGRATED AUDIO WARNING SYSTEM OF AVIONICS CONFIGURATION (NOTE 3)
EQ300
J1
P49
ENGINE 1
N_p
N_G
IN 1
RTN 2
IN 3
RTN 4
ENGINE 2
N_p
N_G
IN 5
RTN 6
IN 7
RTN 8
H
GS372
G
GS372
F
GS372
K
GS372
J
GS372
D
GS370
C
GS370
K
GS418
P435-A7
P435-A8
P435-A12
P435-A11
P435-A16
P435-A17
P435-A13
P435-A14
POWER PLANTS

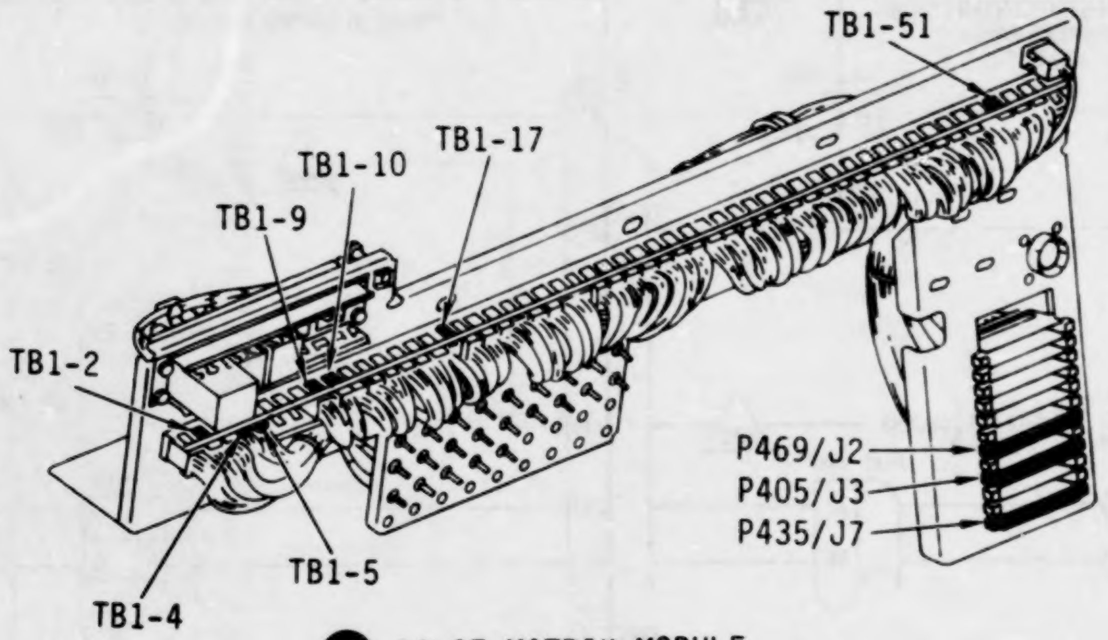
SHEET 2 OF 2 MM04/1-968-2F

9-33-3. AUDIO WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

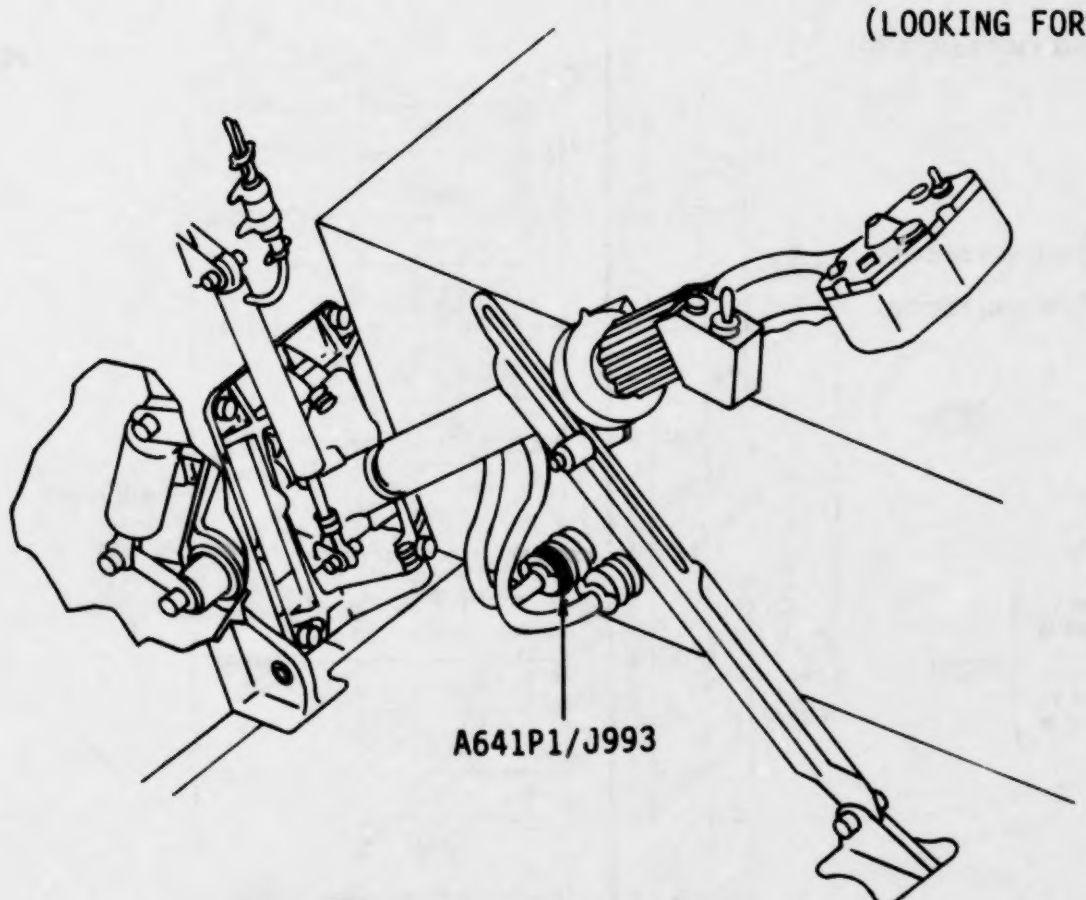

PILOT STATION
C
F
B
D
A
E



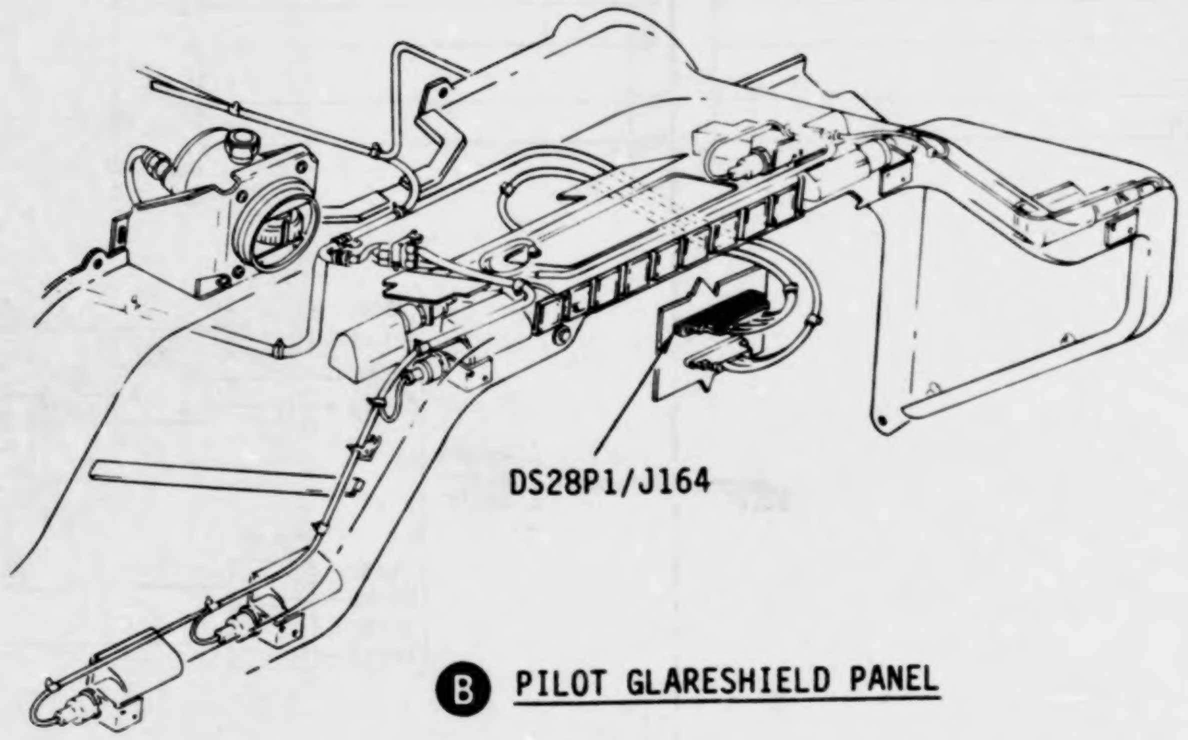
(LOOKING FORWARD)


TB1-51
TB1-17
TB1-10
TB1-9
TB1-2
P469/J2
P405/J3
P435/J7
TB1-5
TB1-4

D PILOT MATRIX MODULE
(LOOKING AFT)


A641P1/J993

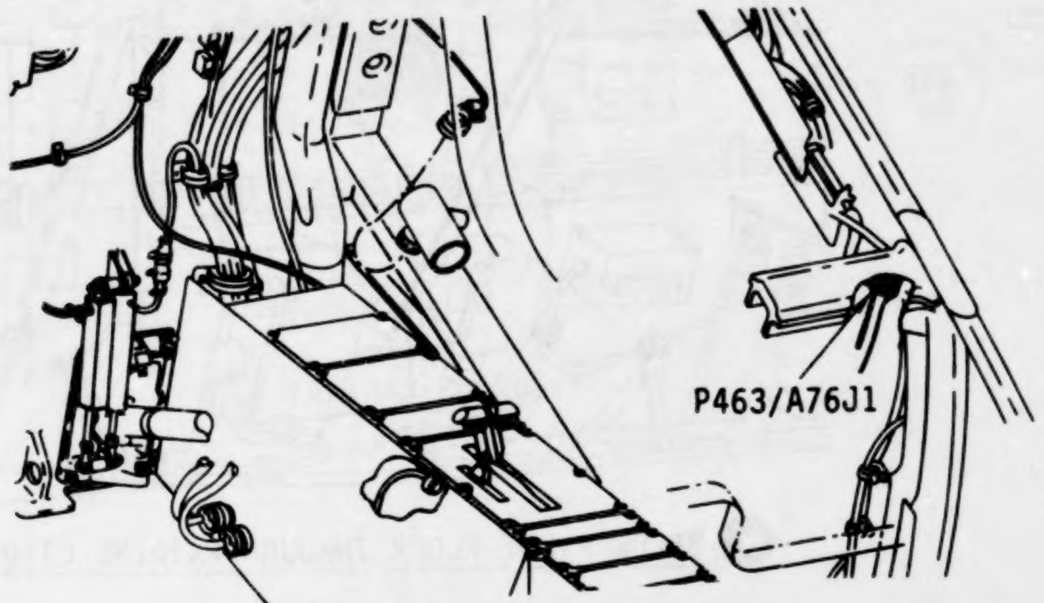
A PILOT COLLECTIVE STICK


DS28P1/J164

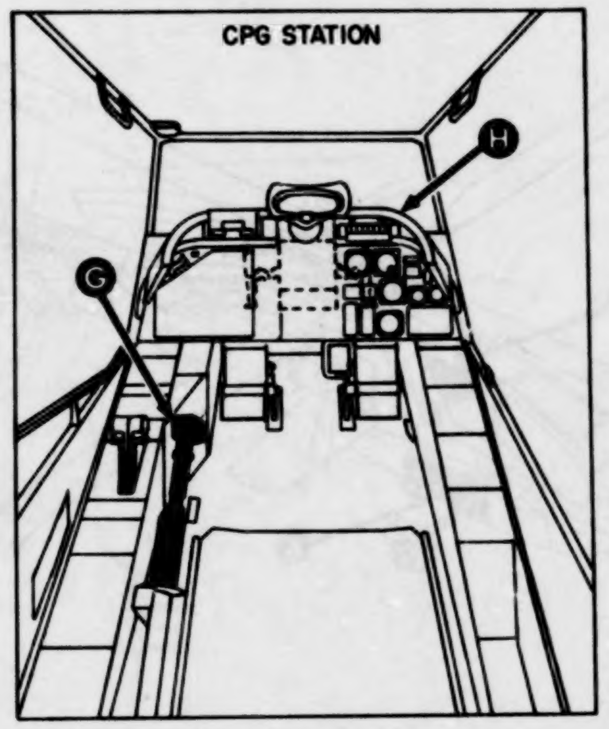
B PILOT GLARESHIELD PANEL

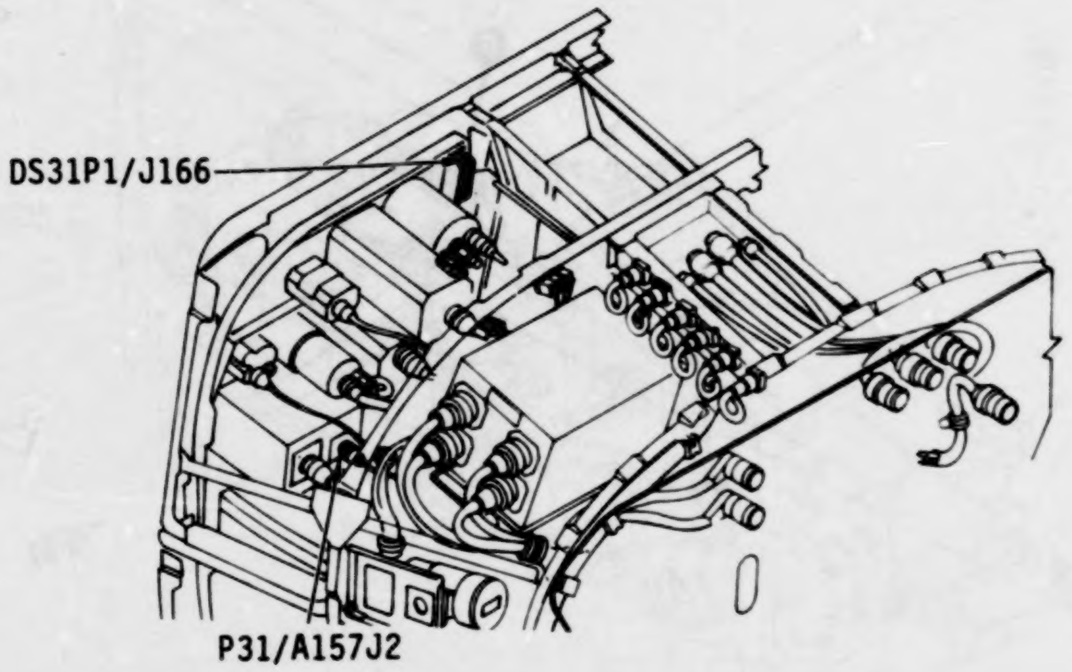
MM04/1-1176-1E

9-33-3. AUDIO WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

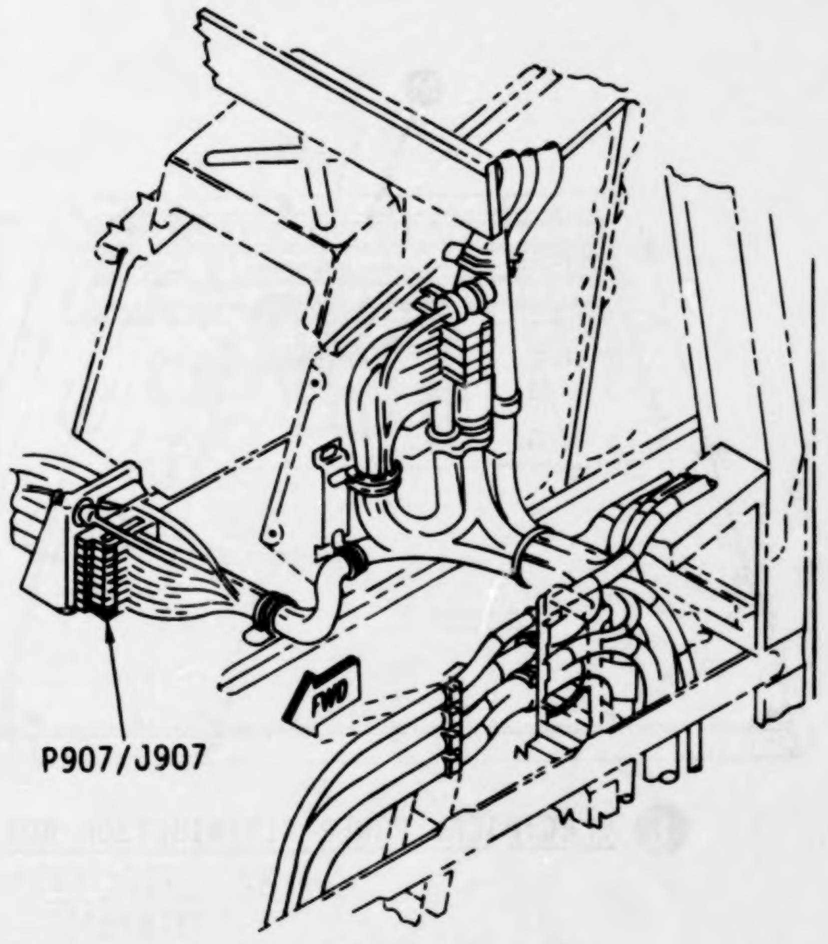


C PILOT STATION (LEFT SIDE)

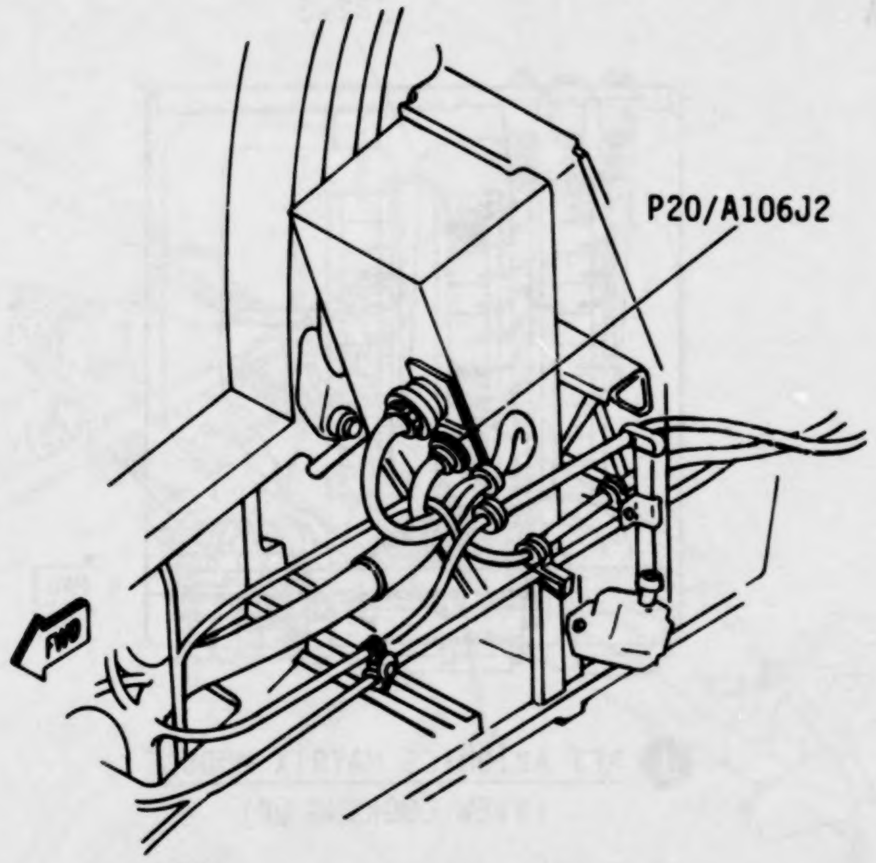

CPG STATION
H
G


DS31P1/J166
P31/A157J2

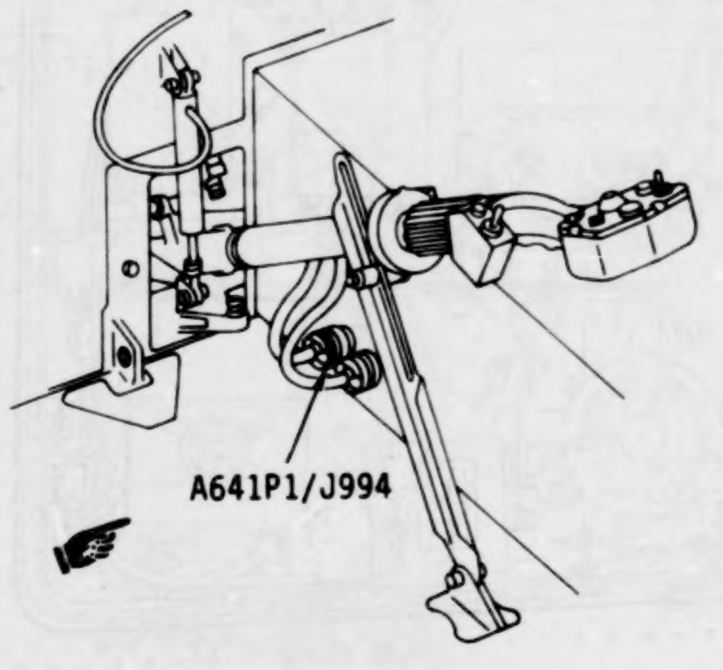
H CPG INSTRUMENT PANEL (AFT VIEW)


P907/J907
FWD

F PILOT/CPG CROSSOVER


P20/A106J2
FWD

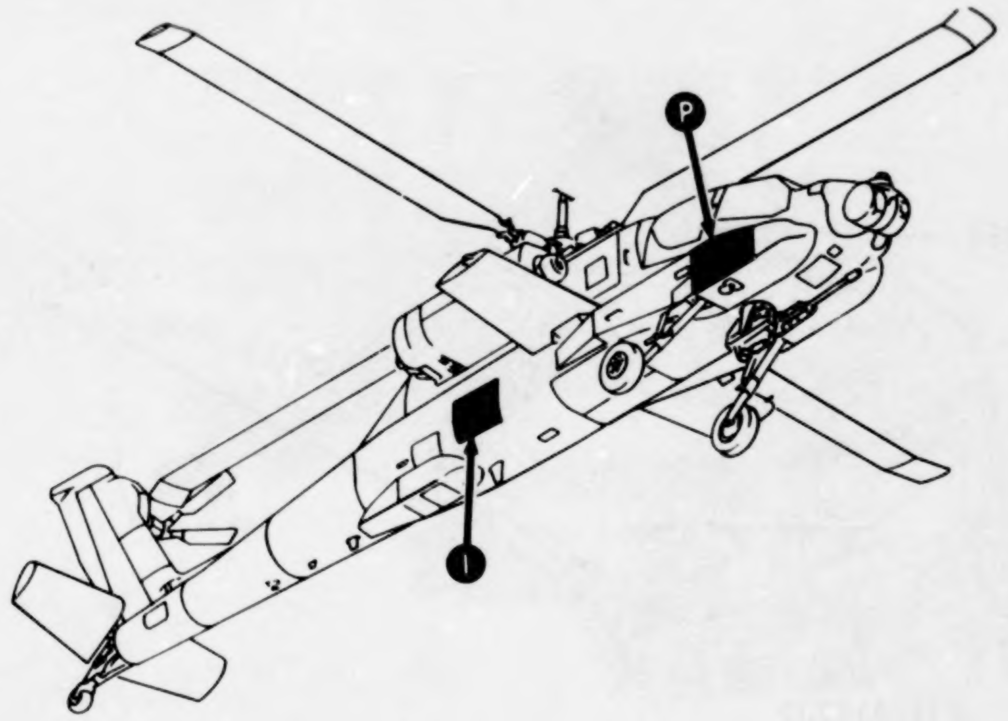
E PILOT RIGHT SIDE CONSOLE

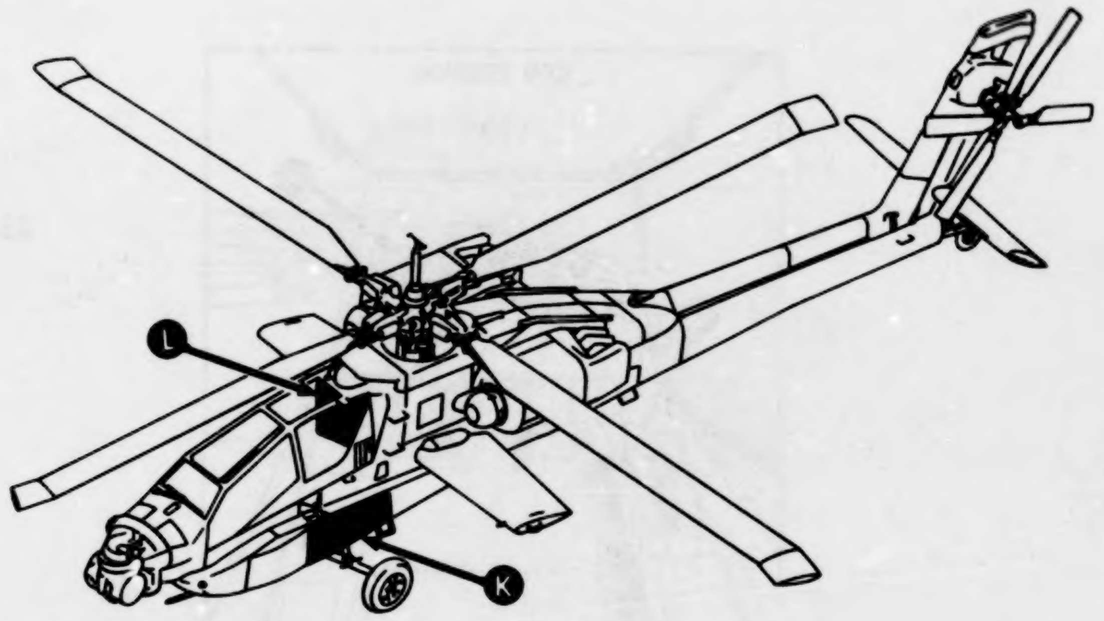

A641P1/J994

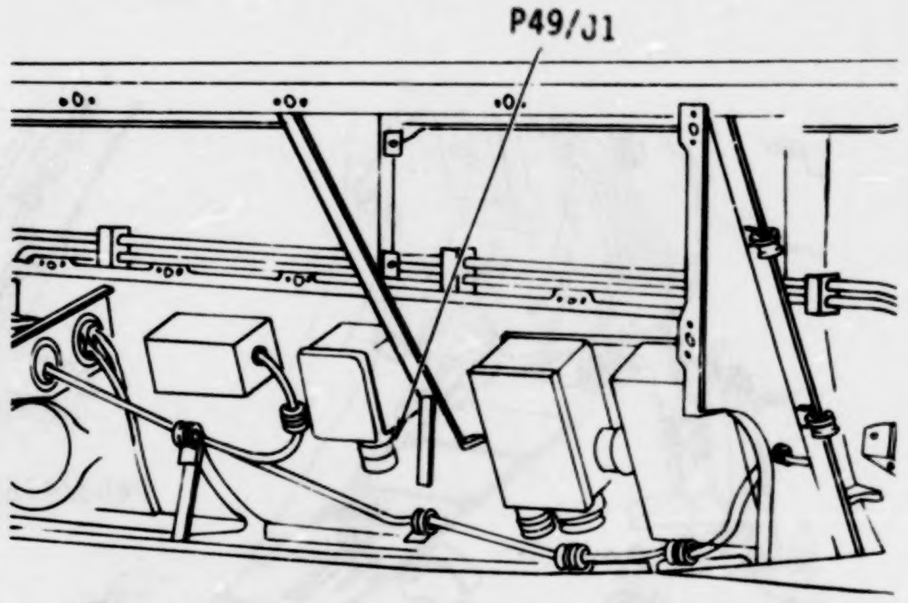
G CPG COLLECTIVE STICK

MM04/1-1176-2C

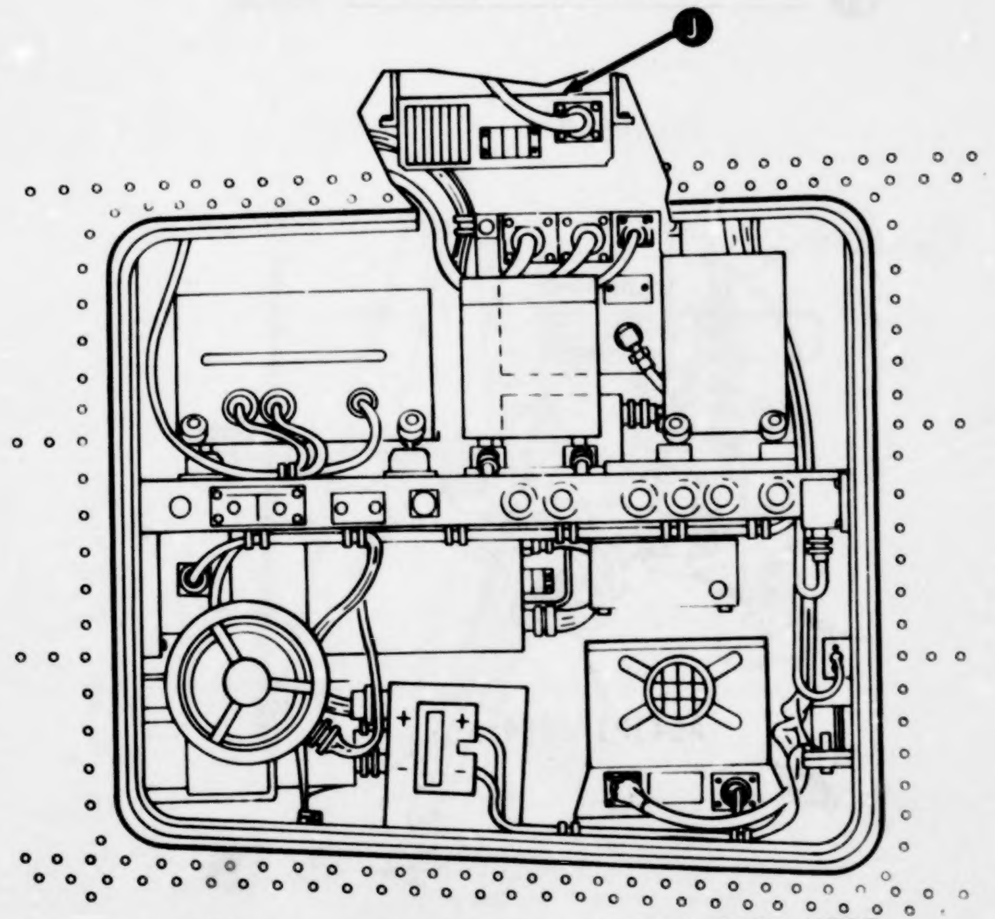
9-33-3. AUDIO WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



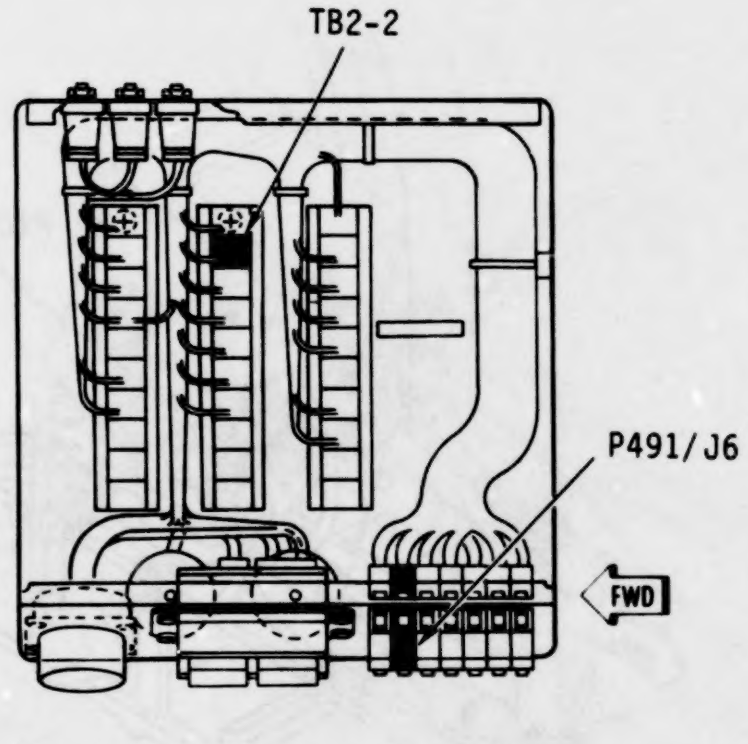




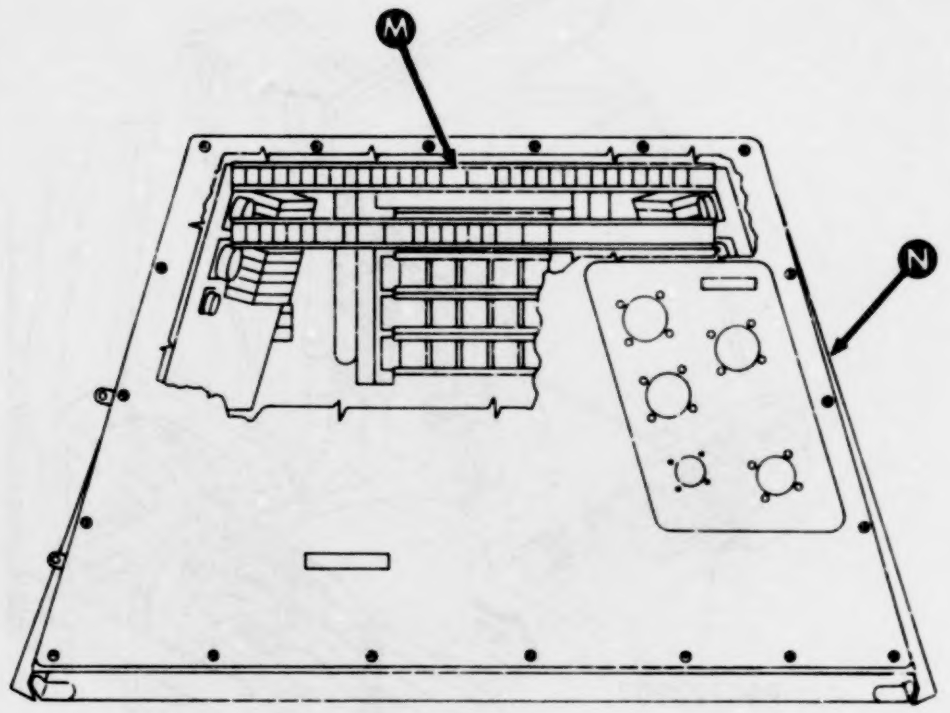
Ⓚ BELOW PILOT FLOOR THROUGH FAIRING L140



Ⓘ AFT AVIONICS BAY THROUGH DOOR R295



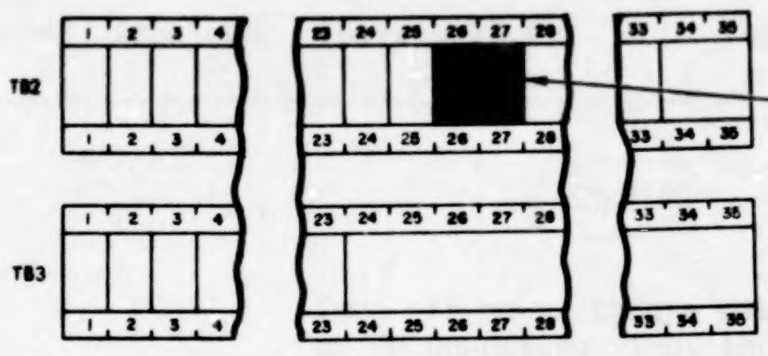
Ⓙ AFT AVIONICS MATRIX MODULE
(VIEW LOOKING UP)



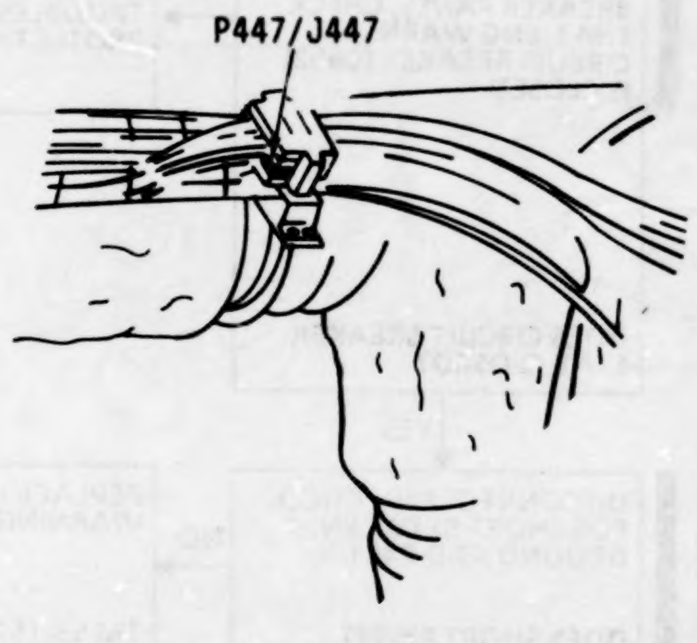
Ⓛ ELECTRICAL POWER DISTRIBUTION BOX

MM04/1-1176-3E

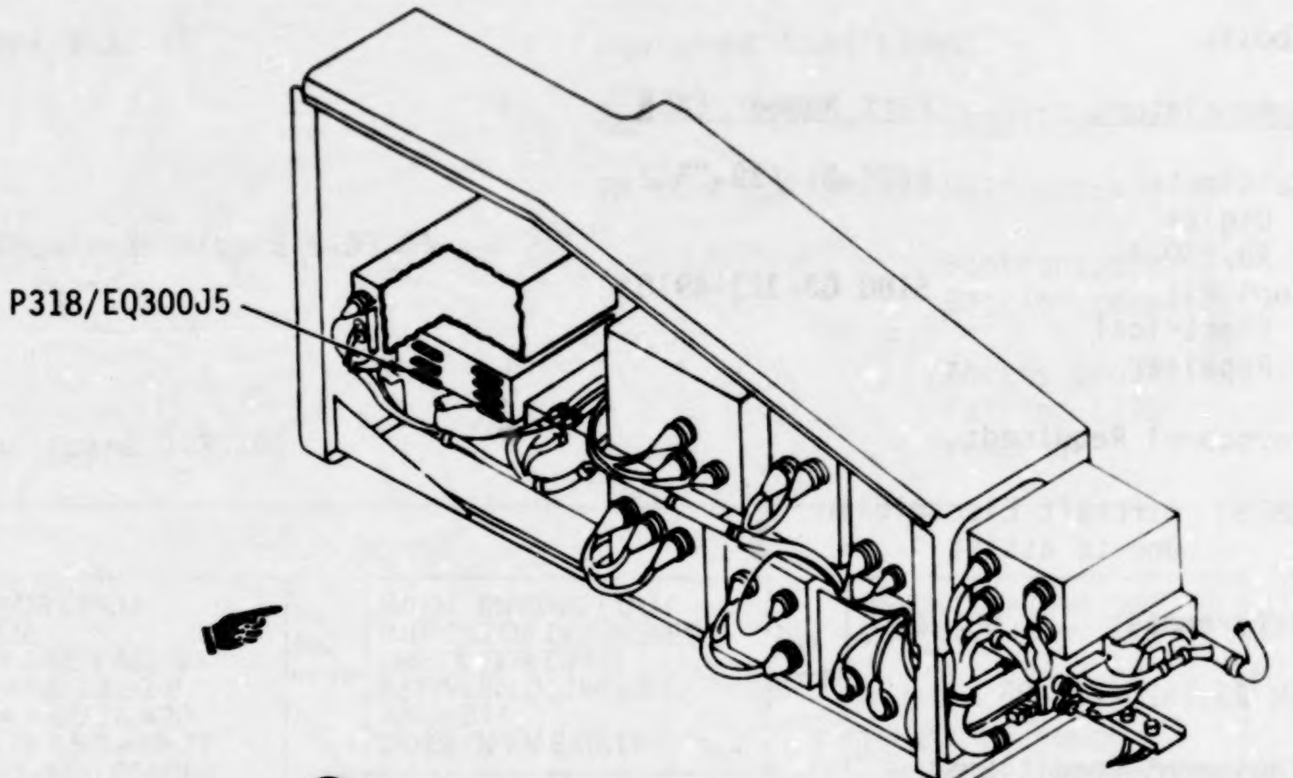
9-33-3. AUDIO WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


TB2
TB3
1
2
3
4
23
24
25
26
27
28
33
34
35
TB2-26/27

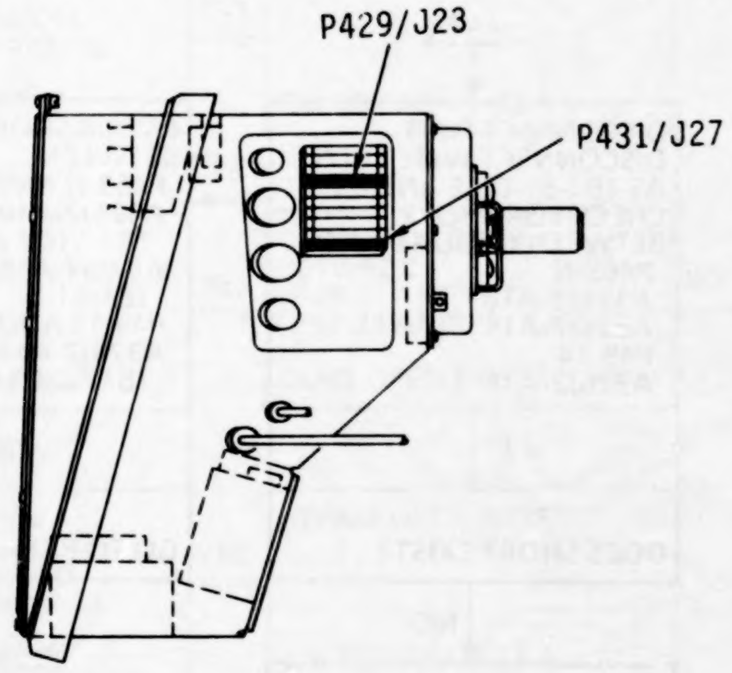
Ⓜ TERMINAL BOARDS



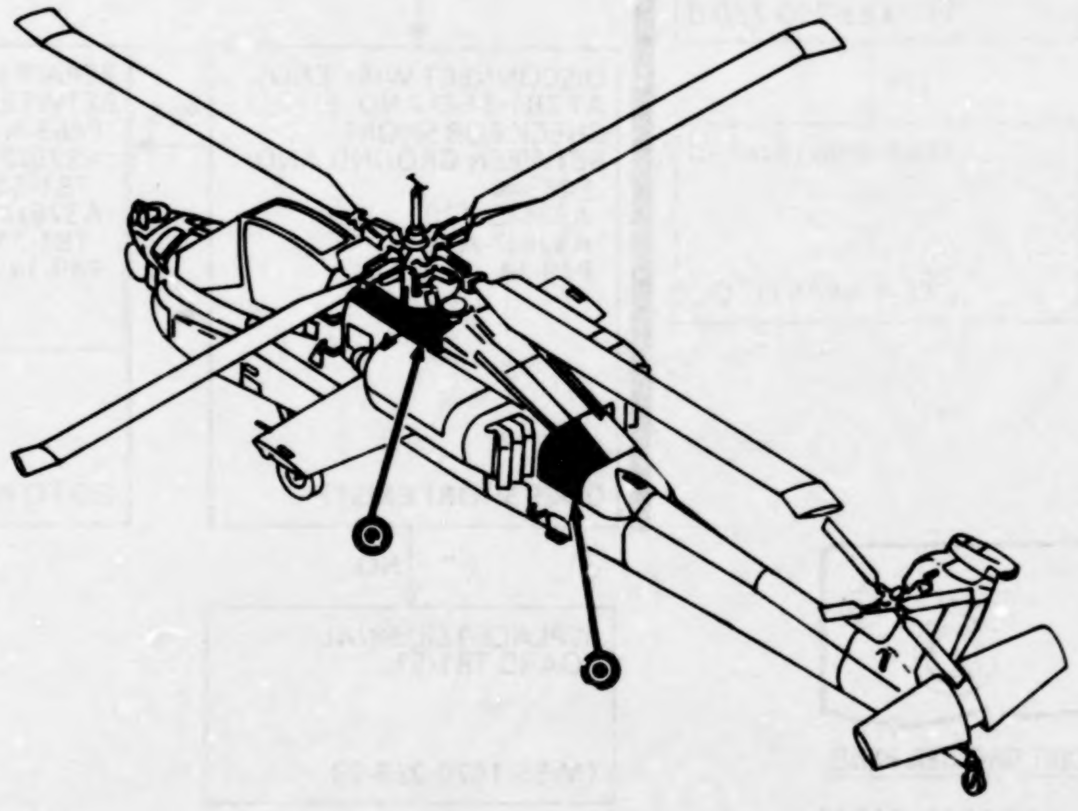
Ⓠ AFT DECK THROUGH FAIRING T205L

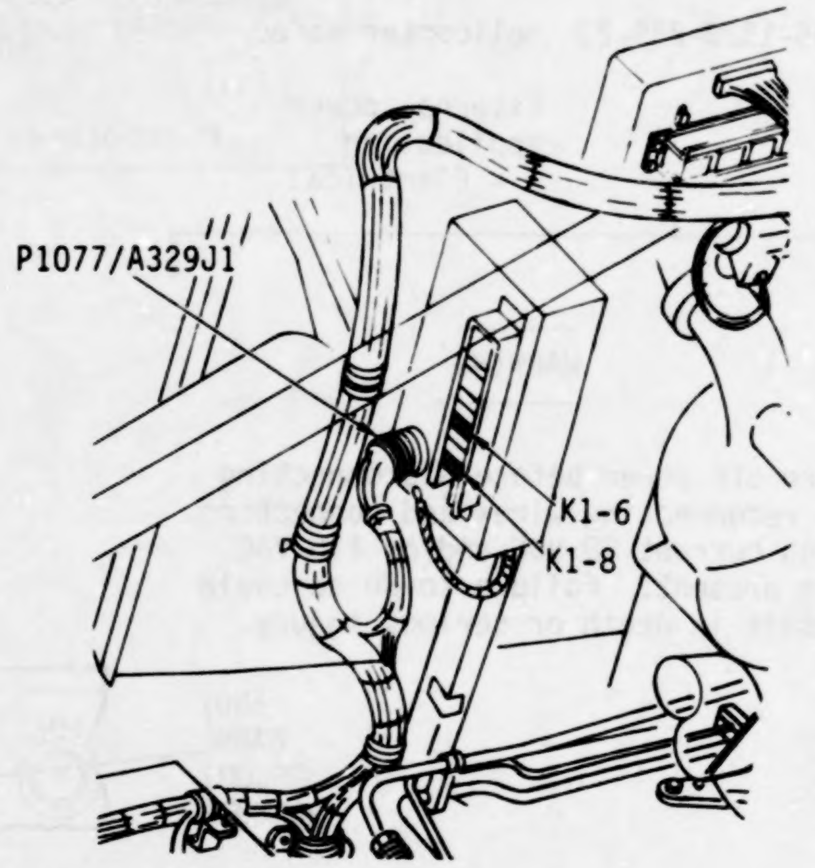

P318/EQ300J5

Ⓟ RIGHT FORWARD AVIONICS BAY THROUGH DOOR R90


P429/J23
P431/J27

Ⓝ LEFT SIDE VIEW (ROTATED)




P1077/A329J1
K1-6
K1-8

Ⓞ AFT DECK THROUGH DOOR L325

MM04/1-1176-4C

9-33-4. ENG WARN CIRCUIT BREAKER (CB52) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One to assist

References:

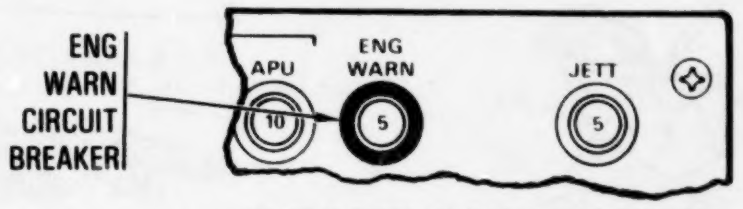
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

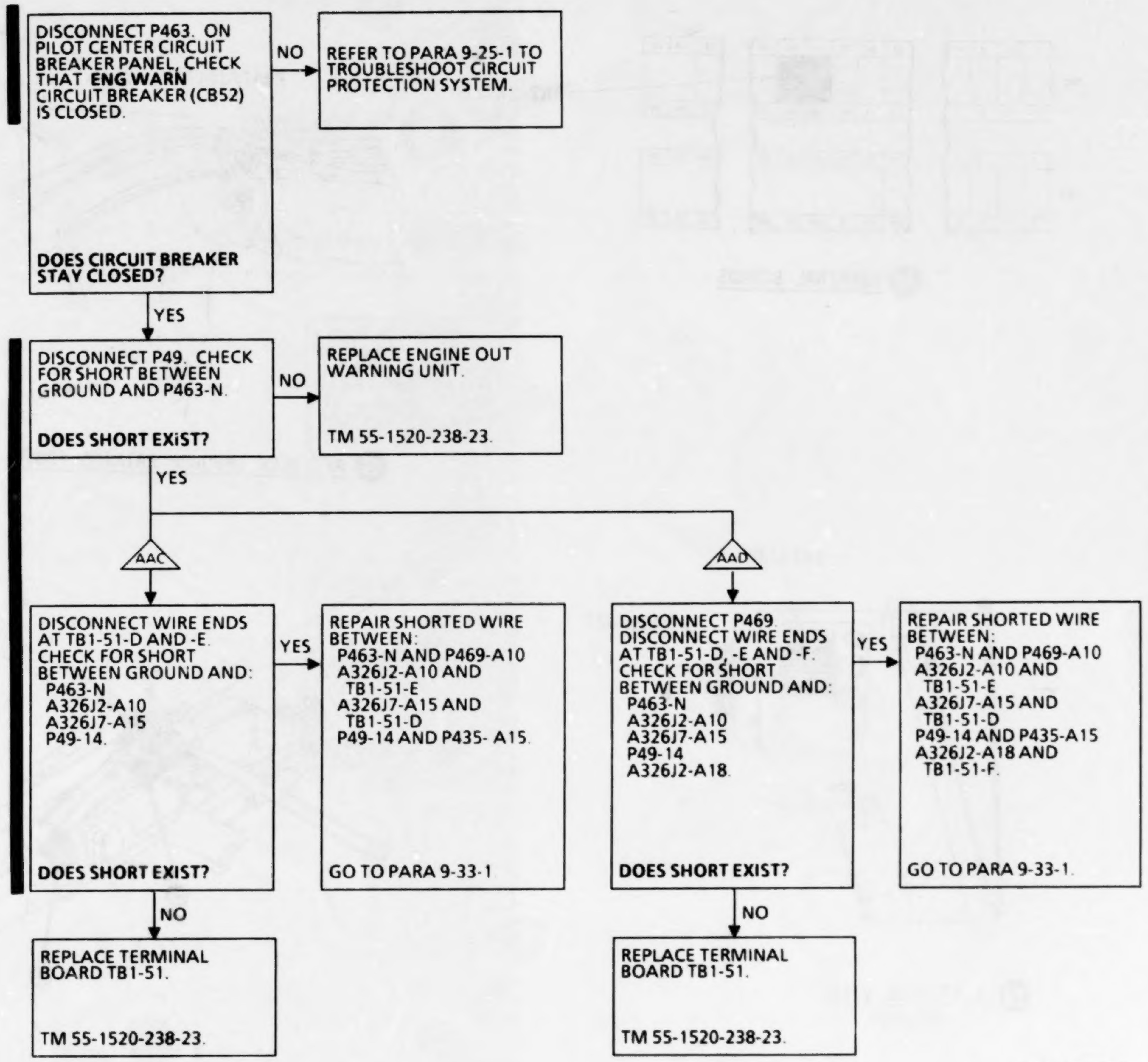
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1196A


DISCONNECT P463. ON PILOT CENTER CIRCUIT BREAKER PANEL, CHECK THAT **ENG WARN** CIRCUIT BREAKER (CB52) IS CLOSED.

DOES CIRCUIT BREAKER STAY CLOSED?

NO: REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

YES: DISCONNECT P49. CHECK FOR SHORT BETWEEN GROUND AND P463-N.

DOES SHORT EXIST?

NO: REPLACE ENGINE OUT WARNING UNIT. TM 55-1520-238-23.

YES:

DISCONNECT WIRE ENDS AT TB1-51-D AND -E. CHECK FOR SHORT BETWEEN GROUND AND:
P463-N
A326J2-A10
A326J7-A15
P49-14.

DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN:
P463-N AND P469-A10
A326J2-A10 AND TB1-51-E
A326J7-A15 AND TB1-51-D
P49-14 AND P435- A15.
GO TO PARA 9-33-1

NO: REPLACE TERMINAL BOARD TB1-51. TM 55-1520-238-23.

DISCONNECT P469. DISCONNECT WIRE ENDS AT TB1-51-D, -E AND -F. CHECK FOR SHORT BETWEEN GROUND AND:
P463-N
A326J2-A10
A326J7-A15
P49-14
A326J2-A18.

DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN:
P463-N AND P469-A10
A326J2-A10 AND TB1-51-E
A326J7-A15 AND TB1-51-D
P49-14 AND P435-A15
A326J2-A18 AND TB1-51-F.
GO TO PARA 9-33-1.

NO: REPLACE TERMINAL BOARD TB1-51. TM 55-1520-238-23.

END OF TASK

9-33-5. LOW RPM ROTOR AUDIO WARNING - IS NOT HEARD IN EITHER PILOT OR CPG HEADSET

Tools: (para 9-33-4)

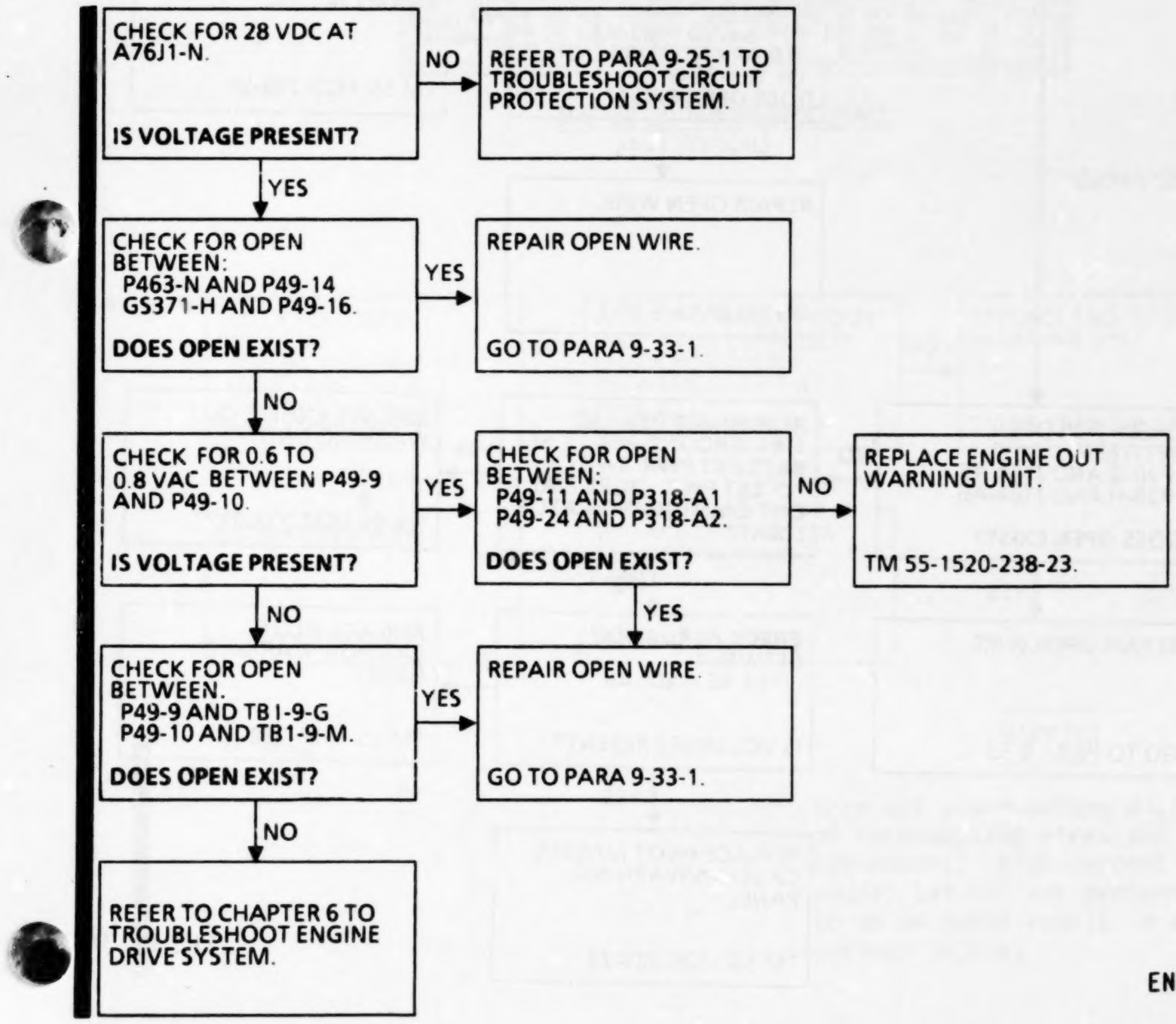
Personnel Required: (para 9-33-4)

References: (para 9-33-4)

Equipment Conditions: (para 9-33-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT A76J1-N.
IS VOLTAGE PRESENT?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR OPEN BETWEEN:
P463-N AND P49-14
GS371-H AND P49-16.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
CHECK FOR 0.6 TO 0.8 VAC BETWEEN P49-9 AND P49-10.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P49-11 AND P318-A1
P49-24 AND P318-A2.
DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
CHECK FOR OPEN BETWEEN.
P49-9 AND TB1-9-G
P49-10 AND TB1-9-M.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
REFER TO CHAPTER 6 TO TROUBLESHOOT ENGINE DRIVE SYSTEM.

END OF TASK

9-33-6. PILOT ENGINE 1 OUT INDICATOR - DOES NOT RESET AUDIO WARNING

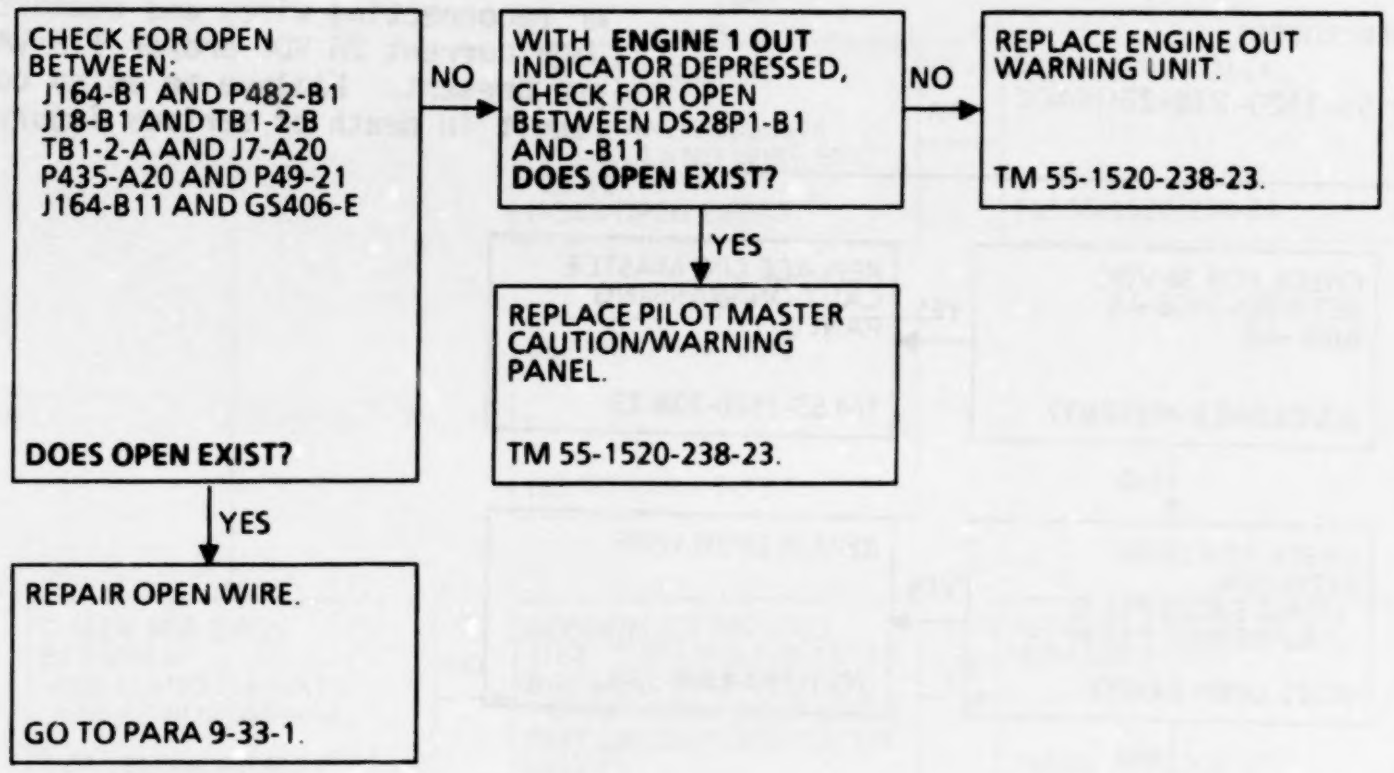
Tools: (para 9-33-4)

Personnel Required: (para 9-33-4)

References: (para 9-33-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter
	Nontransparent barrier removed
	Access provisions - fairing L175 removed


CHECK FOR OPEN BETWEEN:
J164-B1 AND P482-B1
J18-B1 AND TB1-2-B
TB1-2-A AND J7-A20
P435-A20 AND P49-21
J164-B11 AND GS406-E
DOES OPEN EXIST?
NO
WITH ENGINE 1 OUT INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS28P1-B1 AND -B11
DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT.
TM 55-1520-238-23.
YES
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.

END OF TASK

9-33-7. CPG ENGINE 1 OUT INDICATOR - IS NOT LIGHTED WITH ENGINE 1 NOT RUNNING

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

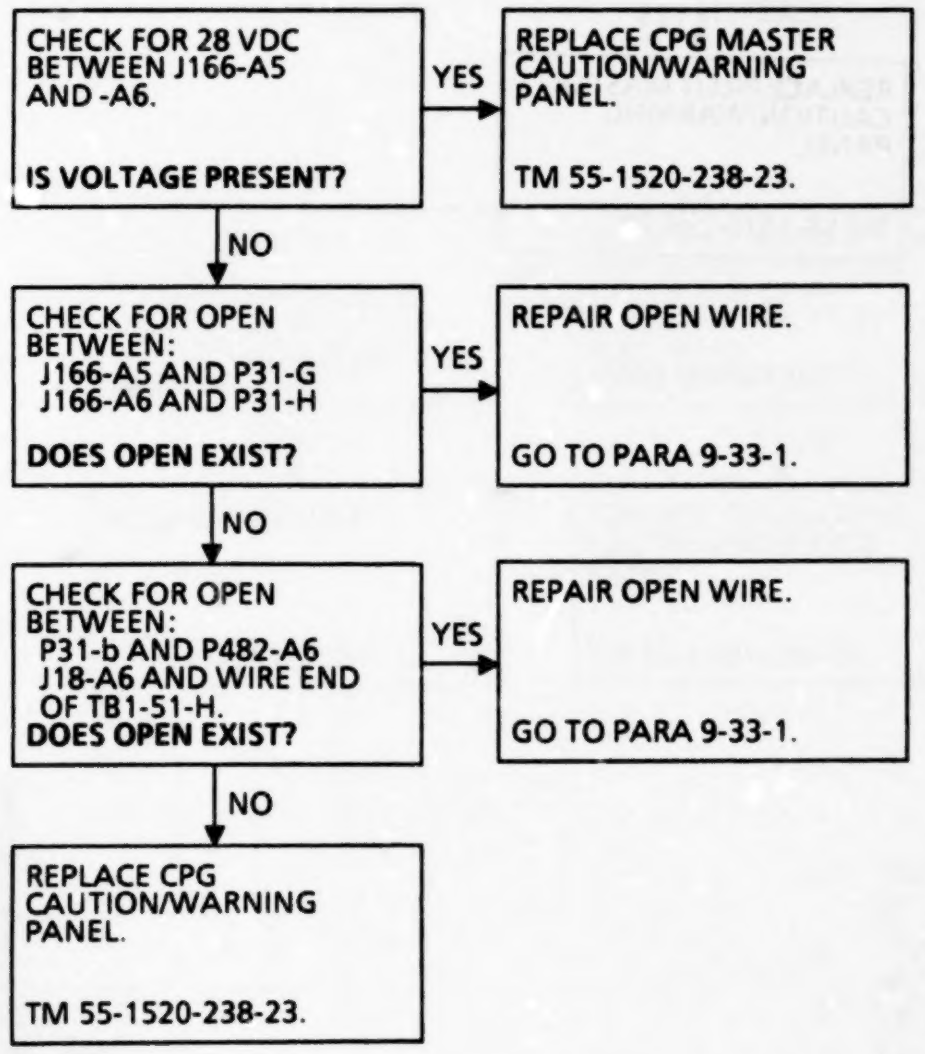
TM 55-1520-238-23

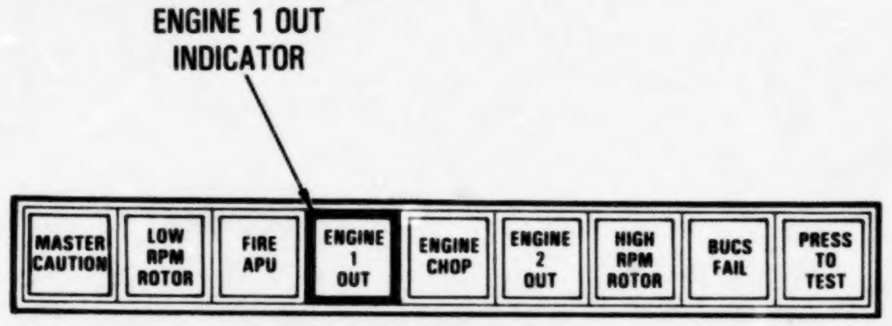
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN J166-A5 AND -A6.
IS VOLTAGE PRESENT?
YES
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN: J166-A5 AND P31-G J166-A6 AND P31-H
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
CHECK FOR OPEN BETWEEN: P31-b AND P482-A6 J18-A6 AND WIRE END OF TB1-51-H.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.


ENGINE 1 OUT INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

MASTER CAUTION/WARNING PANEL
(TYPICAL)

END OF TASK

9-33-8. PILOT ENGINE 1 OUT INDICATOR - IS NOT LIGHTED WITH ENGINE 1 NOT RUNNING

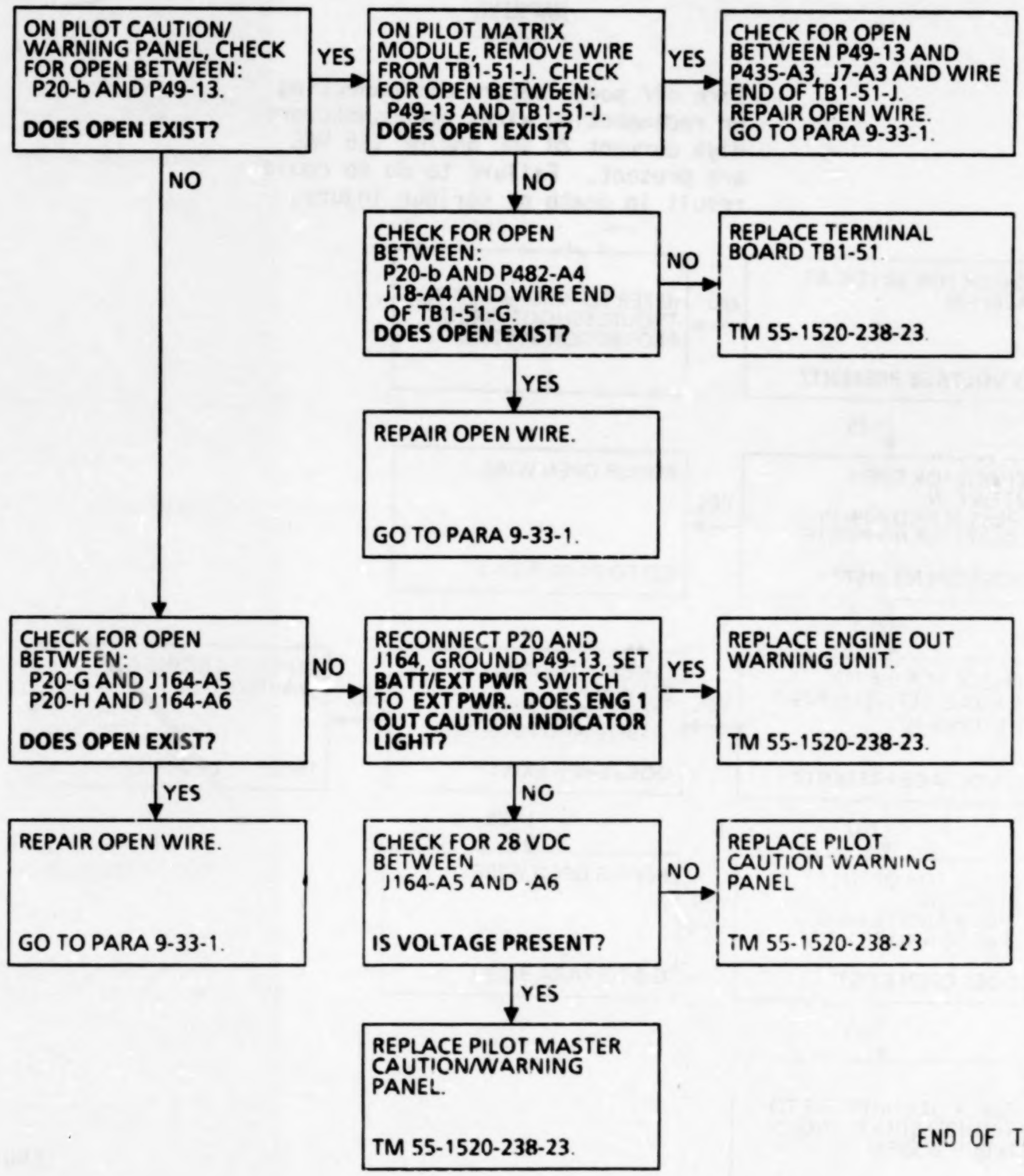
Tools: (para 9-33-7)

Personnel Required: (para 9-33-7)

References: (para 9-33-7)

Equipment Conditions: (para 9-33-7)

REFER TO VOLTAGE WARNING


ON PILOT CAUTION/WARNING PANEL, CHECK FOR OPEN BETWEEN: P20-b AND P49-13.
DOES OPEN EXIST?
YES
ON PILOT MATRIX MODULE, REMOVE WIRE FROM TB1-51-J. CHECK FOR OPEN BETWEEN: P49-13 AND TB1-51-J.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN P49-13 AND P435-A3, J7-A3 AND WIRE END OF TB1-51-J. REPAIR OPEN WIRE. GO TO PARA 9-33-1.
NO
CHECK FOR OPEN BETWEEN: P20-b AND P482-A4 J18-A4 AND WIRE END OF TB1-51-G.
DOES OPEN EXIST?
NO
REPLACE TERMINAL BOARD TB1-51.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
CHECK FOR OPEN BETWEEN: P20-G AND J164-A5 P20-H AND J164-A6
DOES OPEN EXIST?
NO
RECONNECT P20 AND J164, GROUND P49-13, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG 1 OUT CAUTION INDICATOR LIGHT?
YES
REPLACE ENGINE OUT WARNING UNIT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
CHECK FOR 28 VDC BETWEEN J164-A5 AND -A6
IS VOLTAGE PRESENT?
NO
REPLACE PILOT CAUTION WARNING PANEL
TM 55-1520-238-23
YES
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TAS

9-33-9. CPG ENGINE 1 OUT INDICATOR - DOES NOT RESET AUDIO WARNING

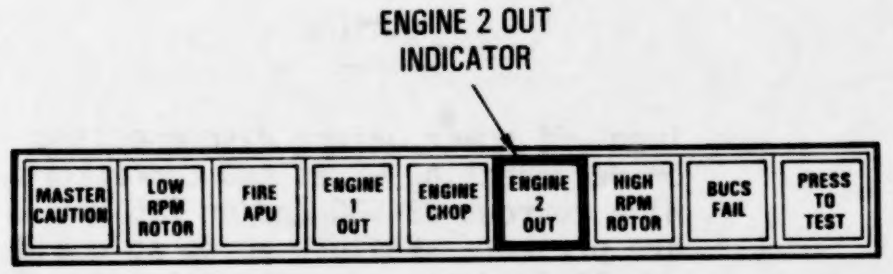
Tools: (para 9-33-7)

Personnel Required: (para 9-33-7)

References: (para 9-33-7)

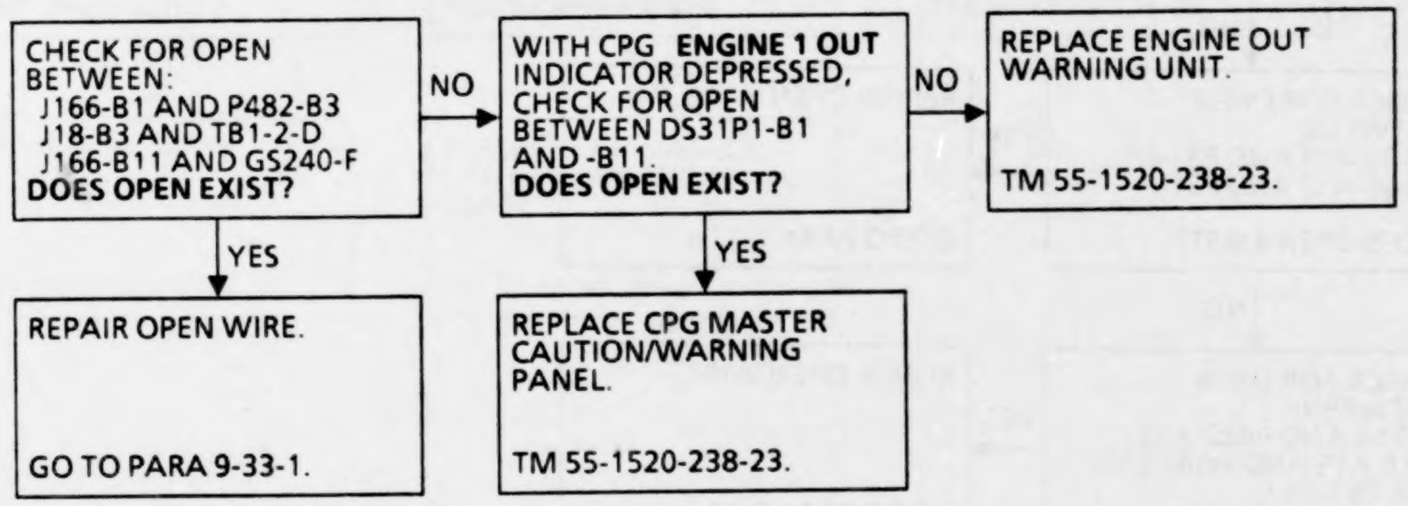
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Nontransparent barrier removed



MASTER CAUTION/WARNING PANEL (TYPICAL)

MM04/1-1201



CHECK FOR OPEN BETWEEN: J166-B1 AND P482-B3 J18-B3 AND TB1-2-D J166-B11 AND GS240-F **DOES OPEN EXIST?**

YES: REPAIR OPEN WIRE. GO TO PARA 9-33-1.

NO: WITH CPG **ENGINE 1 OUT** INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS31P1-B1 AND -B11. **DOES OPEN EXIST?**

YES: REPLACE CPG MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23.

NO: REPLACE ENGINE OUT WARNING UNIT. TM 55-1520-238-23.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-33-10. PILOT ENGINE 2 OUT INDICATOR - IS NOT LIGHTED WITH ENGINE 2 NOT RUNNING

Tools: (para 9-33-7)

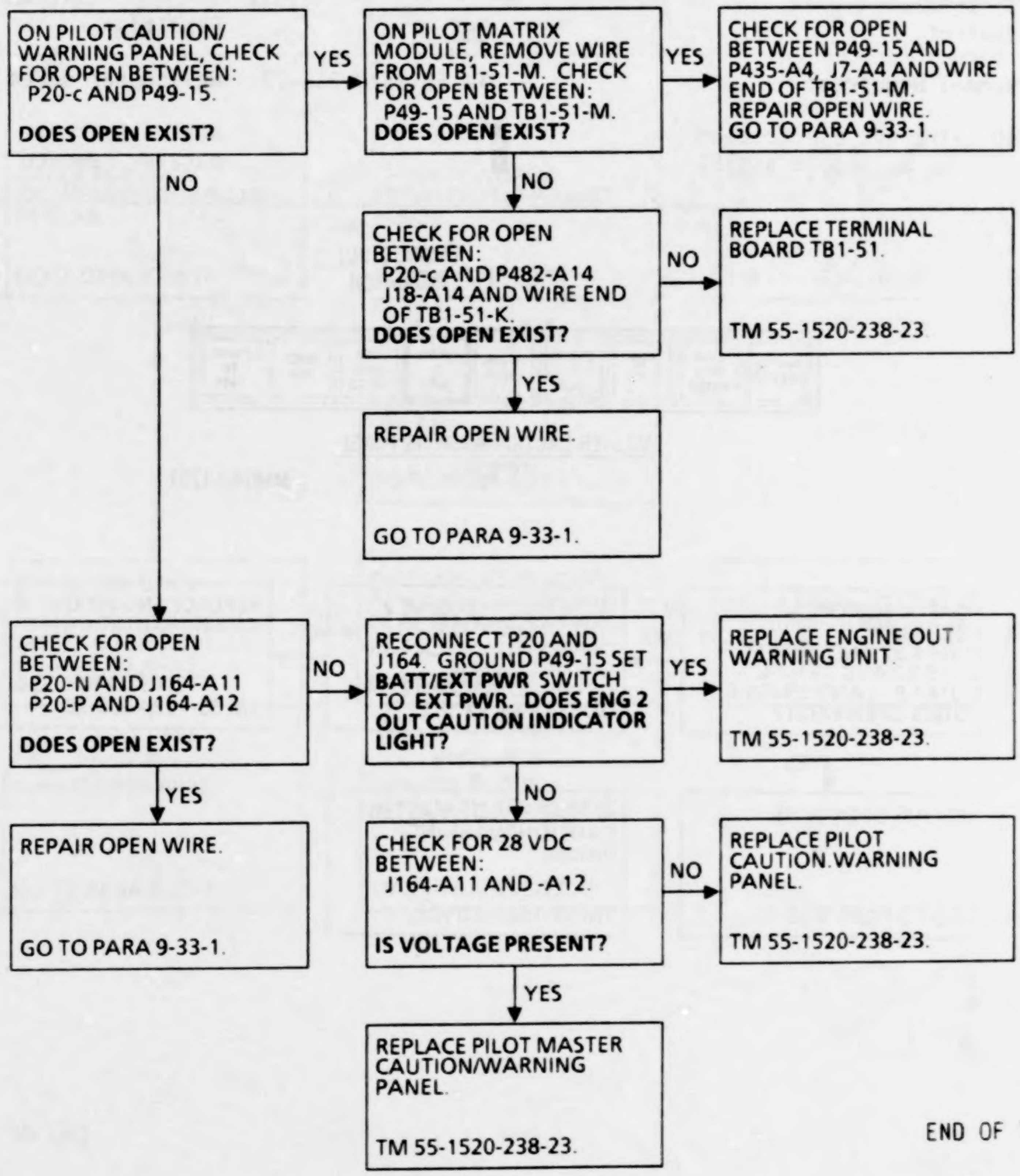
Personnel Required: (para 9-33-7)

References: (para 9-33-7)

REFER TO VOLTAGE WARNING

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Access provisions - L175 fairing removed



ON PILOT CAUTION/ WARNING PANEL, CHECK FOR OPEN BETWEEN: P20-c AND P49-15. **DOES OPEN EXIST?**

YES: ON PILOT MATRIX MODULE, REMOVE WIRE FROM TB1-51-M. CHECK FOR OPEN BETWEEN: P49-15 AND TB1-51-M. **DOES OPEN EXIST?**

- YES: CHECK FOR OPEN BETWEEN P49-15 AND P435-A4, J7-A4 AND WIRE END OF TB1-51-M. REPAIR OPEN WIRE. GO TO PARA 9-33-1.
- NO: CHECK FOR OPEN BETWEEN: P20-c AND P482-A14 J18-A14 AND WIRE END OF TB1-51-K. **DOES OPEN EXIST?**
  - YES: REPAIR OPEN WIRE. GO TO PARA 9-33-1.
  - NO: REPLACE TERMINAL BOARD TB1-51. TM 55-1520-238-23

NO: CHECK FOR OPEN BETWEEN: P20-N AND J164-A11 P20-P AND J164-A12 **DOES OPEN EXIST?**

- YES: REPAIR OPEN WIRE. GO TO PARA 9-33-1.
- NO: RECONNECT P20 AND J164. GROUND P49-15 SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES ENG 2 OUT CAUTION INDICATOR LIGHT?**
  - YES: REPLACE ENGINE OUT WARNING UNIT. TM 55-1520-238-23.
  - NO: CHECK FOR 28 VDC BETWEEN: J164-A11 AND -A12. **IS VOLTAGE PRESENT?**
    - YES: REPLACE PILOT MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23.
    - NO: REPLACE PILOT CAUTION WARNING PANEL. TM 55-1520-238-23.

END OF TASK

9-33-11. PILOT ENGINE 2 OUT INDICATOR - DOES NOT RESET AUDIO WARNING

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

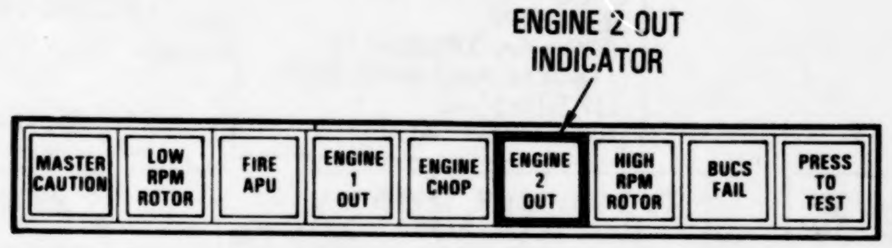
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

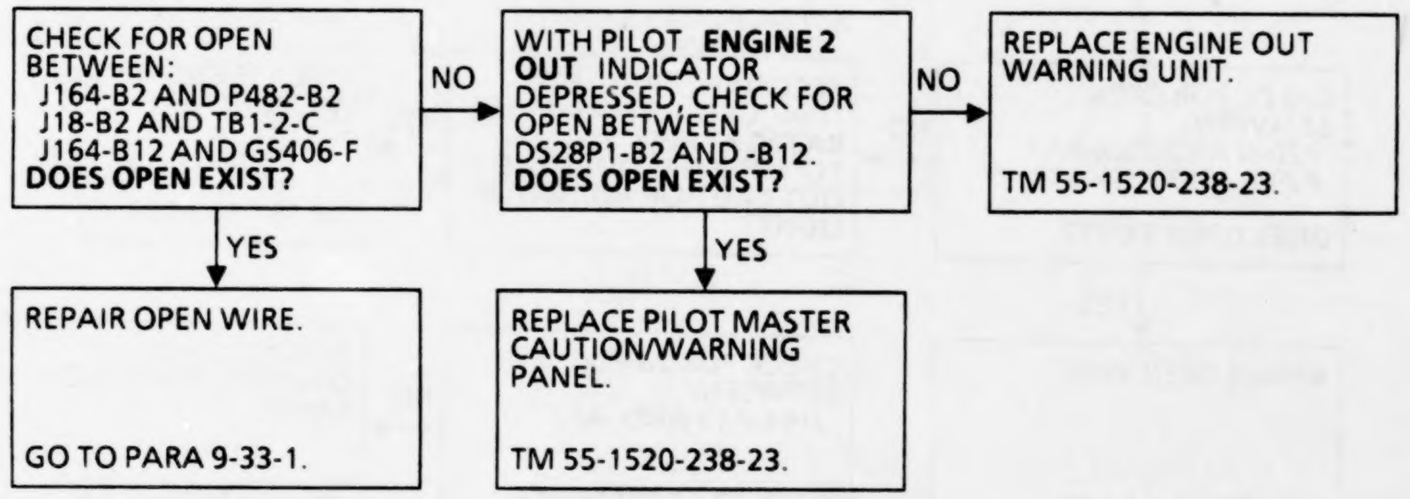
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed


ENGINE 2 OUT INDICATOR
MASTER CAUTION
LOW RPM ROTOR
FIRE APU
ENGINE 1 OUT
ENGINE CHOP
ENGINE 2 OUT
HIGH RPM ROTOR
BUCS FAIL
PRESS TO TEST

MASTER CAUTION/WARNING PANEL
(TYPICAL)

MM04/1-1201


CHECK FOR OPEN BETWEEN: J164-B2 AND P482-B2 J18-B2 AND TB1-2-C J164-B12 AND GS406-F DOES OPEN EXIST?
NO
WITH PILOT ENGINE 2 OUT INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS28P1-B2 AND -B12. DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-33-1.
YES
REPLACE PILOT MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23.

END OF TASK

9-33-12. CPG ENGINE 2 INDICATOR - IS NOT LIGHTED WITH ENGINE 2 NOT RUNNING

Tools: (para 9-33-11)

Personnel Required: (para 9-33-11)

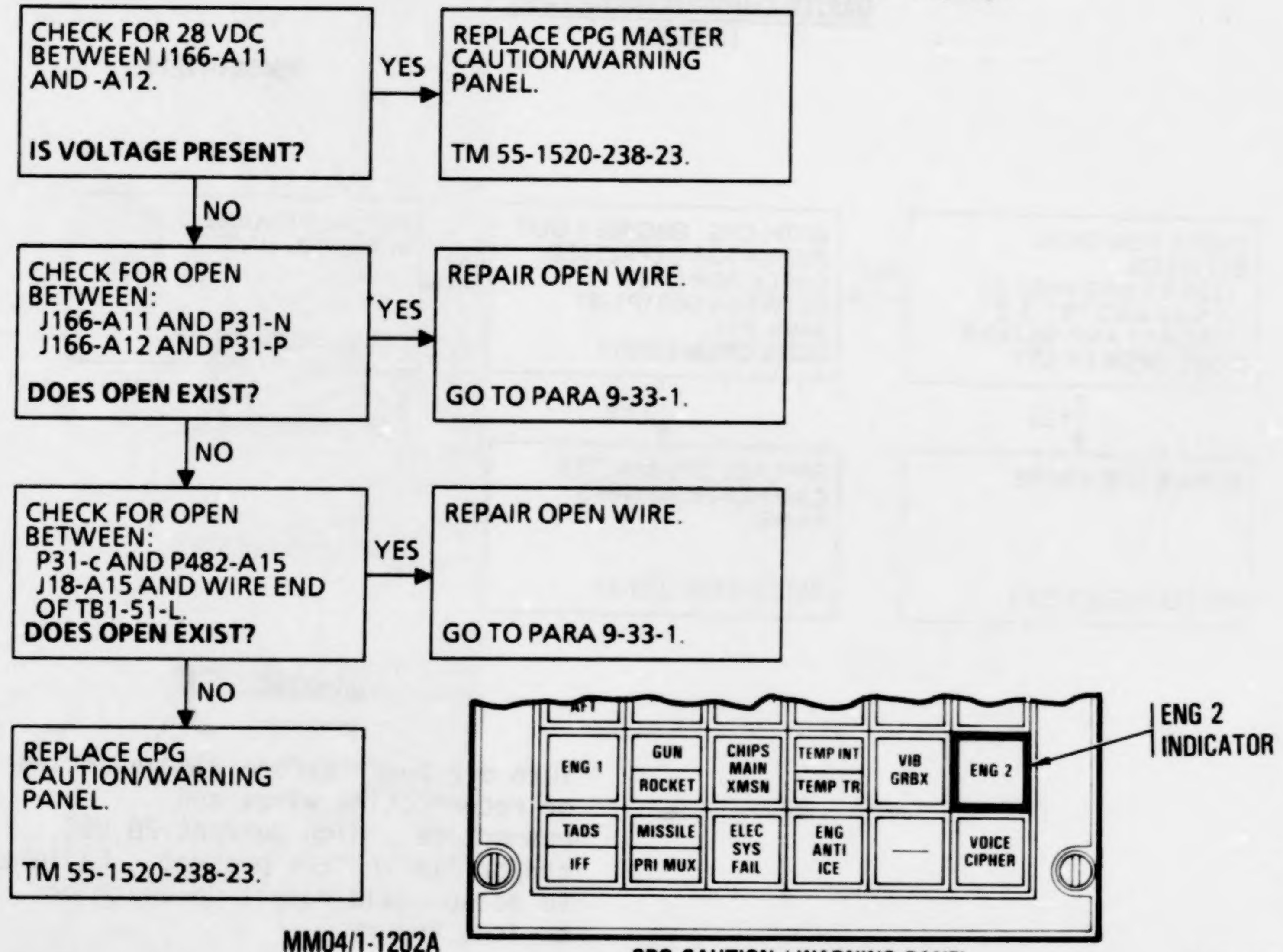
References: (para 9-33-11)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN J166-A11 AND -A12. IS VOLTAGE PRESENT?
YES
REPLACE CPG MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN: J166-A11 AND P31-N J166-A12 AND P31-P DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-33-1.
NO
CHECK FOR OPEN BETWEEN: P31-c AND P482-A15 J18-A15 AND WIRE END OF TB1-51-L. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-33-1.
NO
REPLACE CPG CAUTION/WARNING PANEL. TM 55-1520-238-23.
ENG 2 INDICATOR
ENG 1
GUN
ROCKET
CHIPS MAIN XMSN
TEMP INT
TEMP TR
VIB GRBX
ENG 2
TADS
IFF
MISSILE
PRI MUX
ELEC SYS FAIL
ENG ANTI ICE
VOICE CIPHER

MM04/1-1202A

CPG CAUTION / WARNING PANEL

END OF TASK

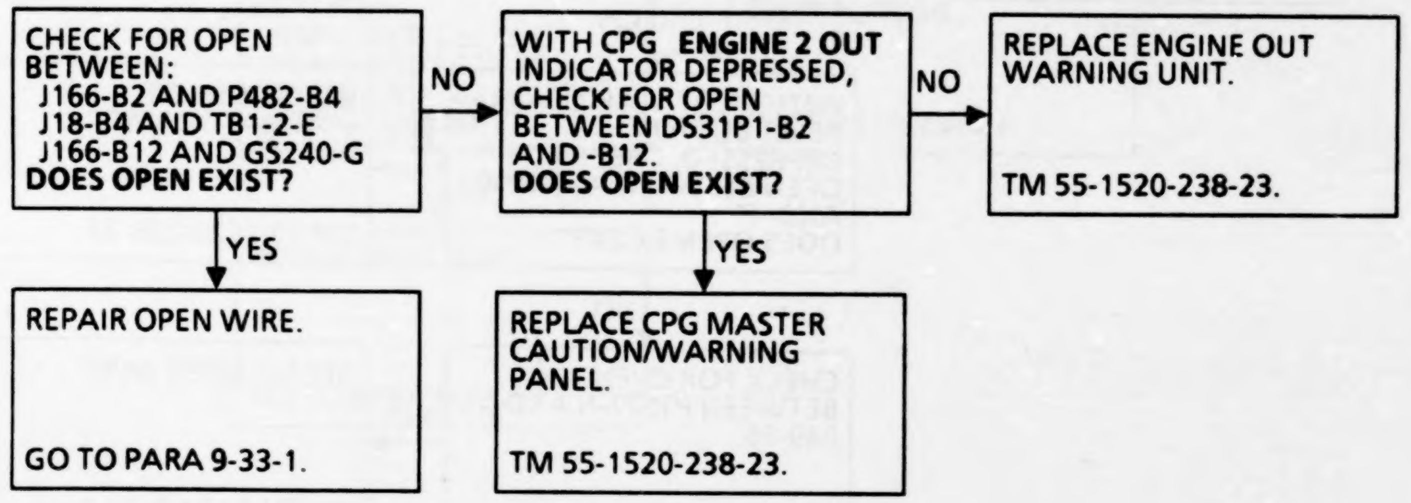
9-33-13. CPG ENGINE 2 OUT INDICATOR - DOES NOT RESET AUDIO WARNING

Tools: (para 9-33-11)

Personnel Required: (para 9-33-11)

References: (para 9-33-11)

Equipment Conditions: (para 9-33-11)


CHECK FOR OPEN BETWEEN: J166-B2 AND P482-B4 J18-B4 AND TB1-2-E J166-B12 AND GS240-G DOES OPEN EXIST?
NO
WITH CPG ENGINE 2 OUT INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS31P1-B2 AND -B12. DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-33-1.
YES
REPLACE CPG MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23.

END OF TASK

9-33-14. STABILATOR AUDIO WARNING - IS NOT HEARD IN EITHER PILOT OR CPG HEADSET

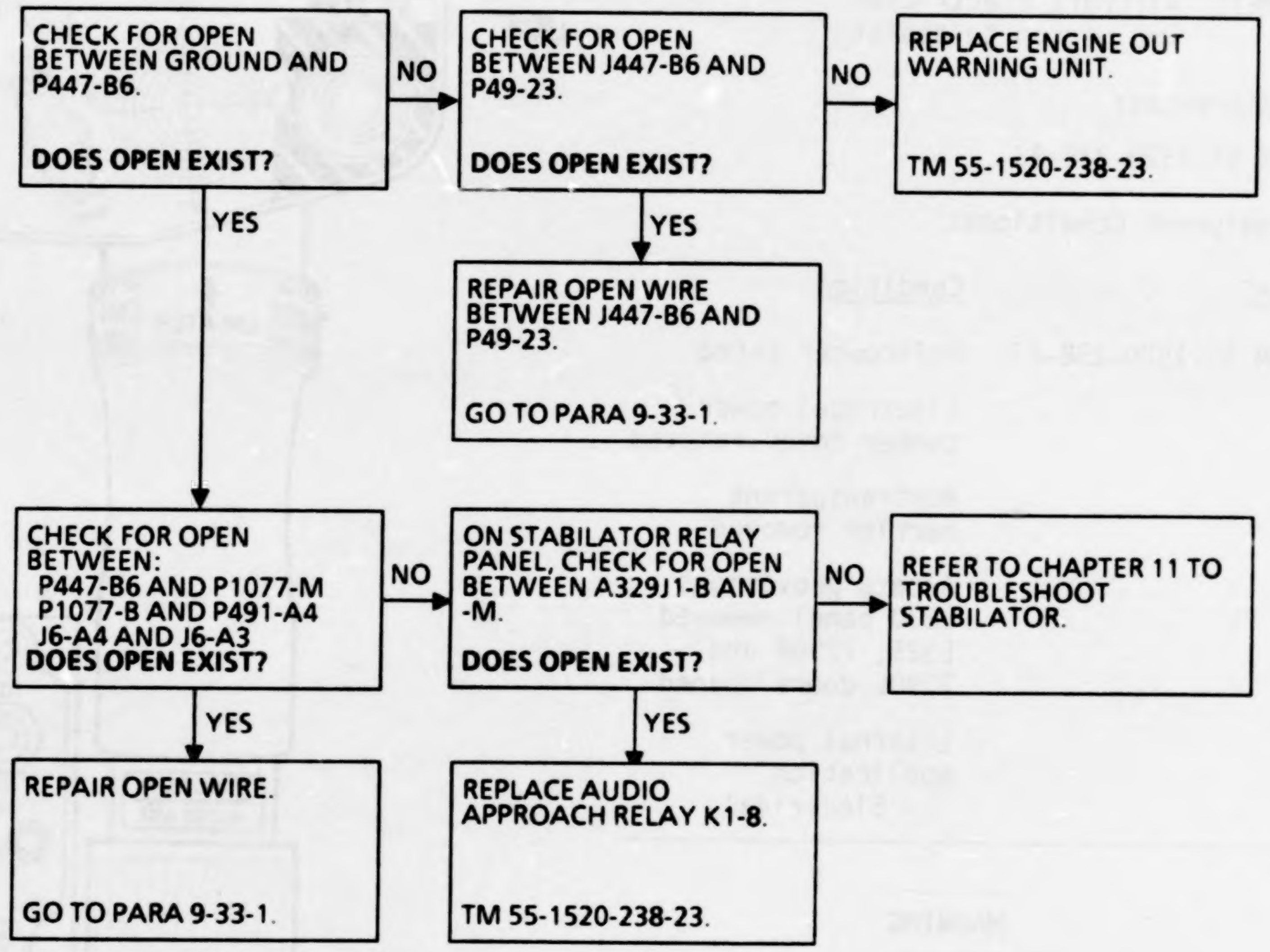
Tools: (para 9-33-11)

Personnel Required: (para 9-33-11)

References: (para 9-33-11)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	L200 panel removed


CHECK FOR OPEN BETWEEN GROUND AND P447-B6. DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN J447-B6 AND P49-23. DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT. TM 55-1520-238-23.
YES
YES
REPAIR OPEN WIRE BETWEEN J447-B6 AND P49-23. GO TO PARA 9-33-1.
CHECK FOR OPEN BETWEEN: P447-B6 AND P1077-M P1077-B AND P491-A4 J6-A4 AND J6-A3 DOES OPEN EXIST?
NO
ON STABILATOR RELAY PANEL, CHECK FOR OPEN BETWEEN A329J1-B AND -M. DOES OPEN EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR.
YES
REPAIR OPEN WIRE. GO TO PARA 9-33-1.
YES
REPLACE AUDIO APPROACH RELAY K1-8. TM 55-1520-238-23.

END OF TASK

9-33-15. PILOT RESET BUTTON - DOES NOT RESET STABILATOR AUDIO WARNING

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

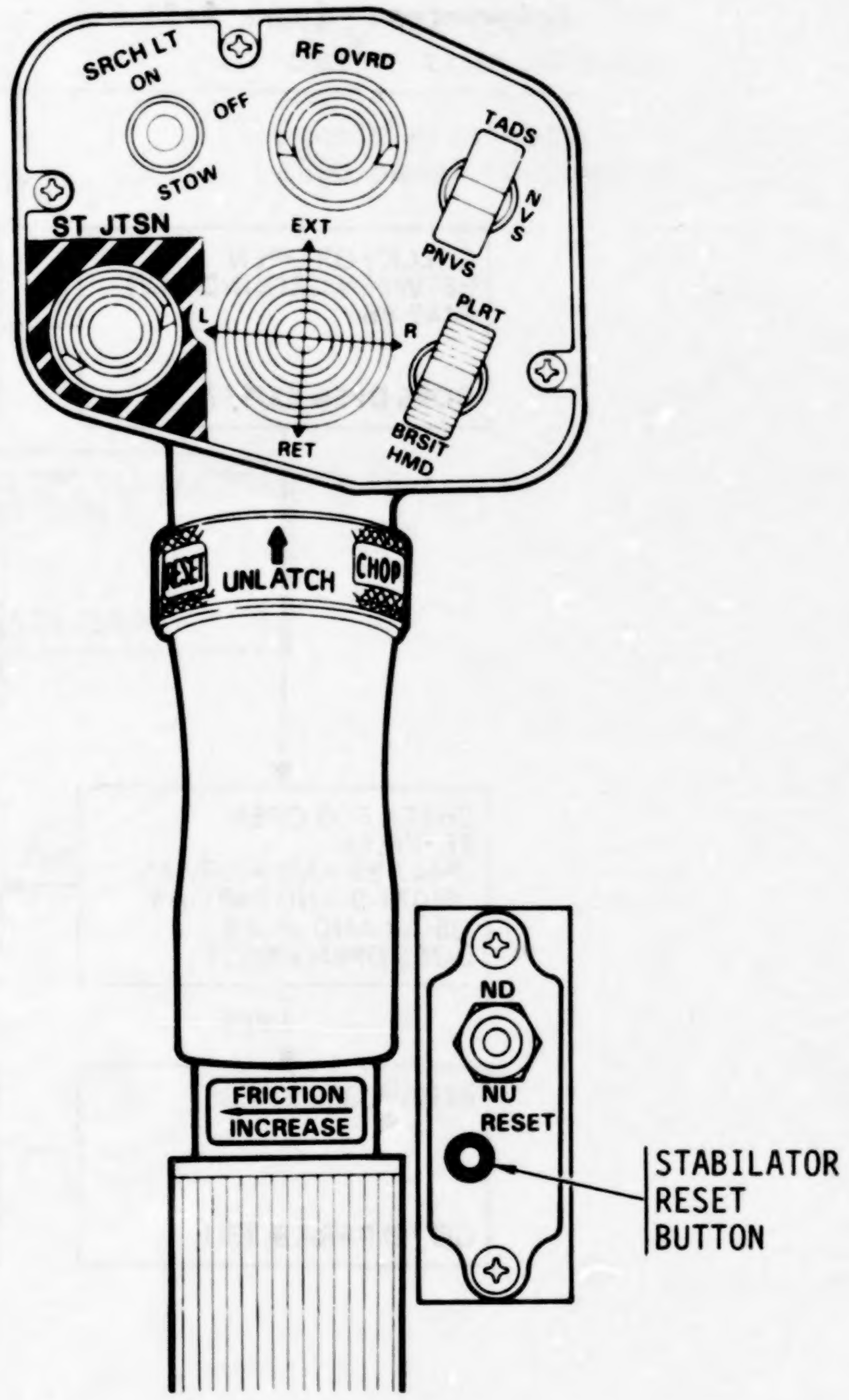
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed
	Nontransparent barrier removed
	Access provisions - L200 panel removed L325, T290R and T290L doors opened
	External power application - Electrical

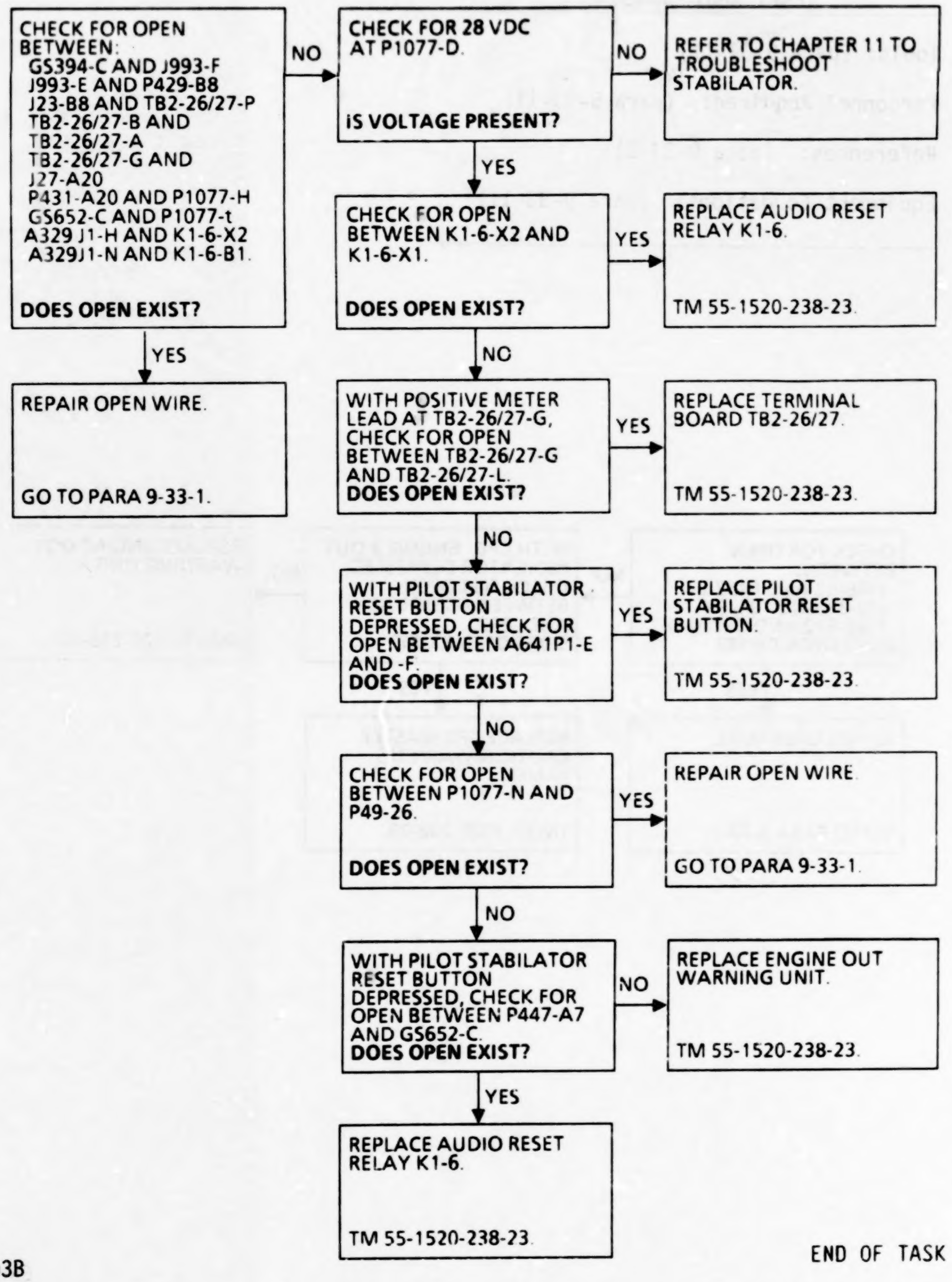
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


SRCH LT
ON
OFF
STOW
RF OVRD
TADS
PNVS
ST JTSN
EXT
L
R
RET
PLRT
BRSIT HMD
RESET
UNLATCH
CHOP
FRICTION INCREASE
ND
NU
RESET
STABILATOR RESET BUTTON

COLLECTIVE STICK (TYPICAL)

MM04/1-1203B


CHECK FOR OPEN BETWEEN:
GS394-C AND J993-F
J993-E AND P429-B8
J23-B8 AND TB2-26/27-P
TB2-26/27-B AND
TB2-26/27-A
TB2-26/27-G AND
J27-A20
P431-A20 AND P1077-H
GS652-C AND P1077-t
A329 J1-H AND K1-6-X2
A329J1-N AND K1-6-B1.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT P1077-D.
IS VOLTAGE PRESENT?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
YES
CHECK FOR OPEN BETWEEN K1-6-X2 AND K1-6-X1.
DOES OPEN EXIST?
YES
REPLACE AUDIO RESET RELAY K1-6.
TM 55-1520-238-23.
NO
WITH POSITIVE METER LEAD AT TB2-26/27-G, CHECK FOR OPEN BETWEEN TB2-26/27-G AND TB2-26/27-L.
DOES OPEN EXIST?
YES
REPLACE TERMINAL BOARD TB2-26/27.
TM 55-1520-238-23.
NO
WITH PILOT STABILATOR RESET BUTTON DEPRESSED, CHECK FOR OPEN BETWEEN A641P1-E AND -F.
DOES OPEN EXIST?
YES
REPLACE PILOT STABILATOR RESET BUTTON.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN P1077-N AND P49-26.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
WITH PILOT STABILATOR RESET BUTTON DEPRESSED, CHECK FOR OPEN BETWEEN P447-A7 AND GS652-C.
DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT.
TM 55-1520-238-23.
YES
REPLACE AUDIO RESET RELAY K1-6.
TM 55-1520-238-23.

END OF TASK

☆U S. GOVERNMENT PRINTING OFFICE: 1989 654-126/80101

9-33-16. CPG RESET BUTTON - DOES NOT RESET STABILATOR AUDIO WARNING

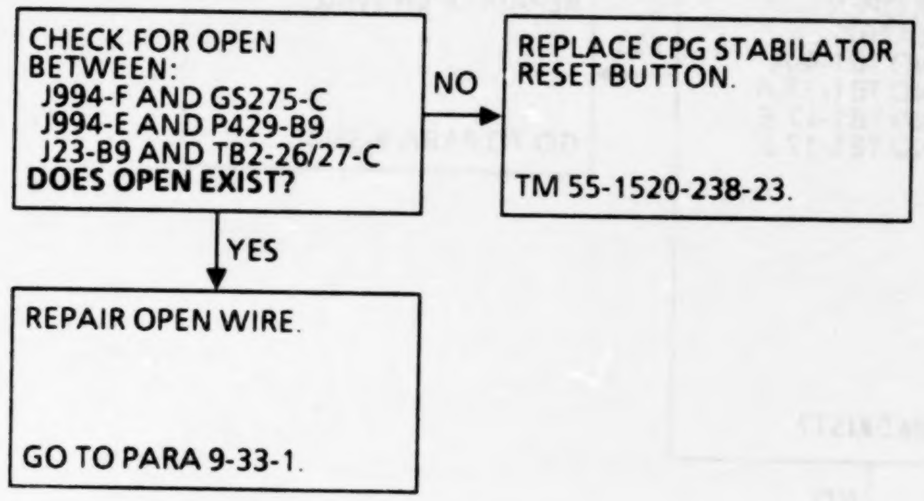
Tools: (para 9-33-15)

Personnel Required: (para 9-33-15)

References: (para 9-33-15)

Equipment Conditions

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed
	Access provisions - L200 panel removed


CHECK FOR OPEN BETWEEN:
J994-F AND GS275-C
J994-E AND P429-B9
J23-B9 AND TB2-26/27-C
DOES OPEN EXIST?
NO
REPLACE CPG STABILATOR RESET BUTTON.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.

END OF TASK

9-33-17. FALSE ENGINE OUT WARNING OCCURS INFLIGHT (SINGLE ENGINE MANEUVER AT HIGH POWER SETTING AND Np LESS THAN 89%)

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanics	5180-00-323-4692
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter AN/URM-105C	6625-00-999-6282

Personnel Required:

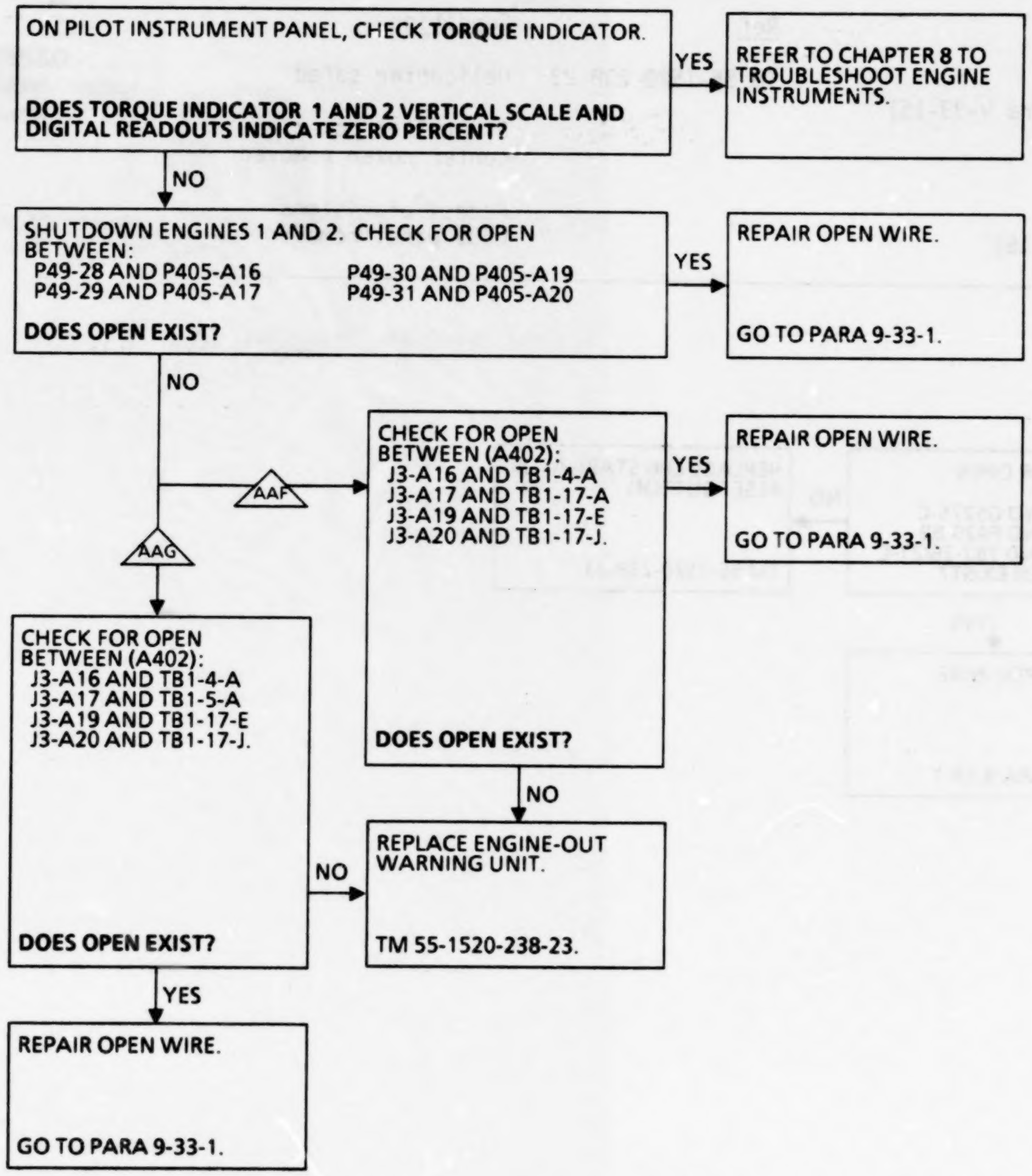
67R10 Attack Helicopter Repairer
68F10 Aircraft Electrician
100KG Pilot

References:

TM 55-1520-238-CL
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter Safed
TM 55-1520-238-CL	No. 1 and No. 2 engines running
Para 1-3-2	ICS connected



ON PILOT INSTRUMENT PANEL, CHECK **TORQUE** INDICATOR.

DOES TORQUE INDICATOR 1 AND 2 VERTICAL SCALE AND DIGITAL READOUTS INDICATE ZERO PERCENT?

YES: REFER TO CHAPTER 8 TO TROUBLESHOOT ENGINE INSTRUMENTS.

NO:

SHUTDOWN ENGINES 1 AND 2. CHECK FOR OPEN BETWEEN:
P49-28 AND P405-A16
P49-29 AND P405-A17
P49-30 AND P405-A19
P49-31 AND P405-A20

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-33-1.

NO:

AAF:

CHECK FOR OPEN BETWEEN (A402):
J3-A16 AND TB1-4-A
J3-A17 AND TB1-17-A
J3-A19 AND TB1-17-E
J3-A20 AND TB1-17-J.

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-33-1.

NO: REPLACE ENGINE-OUT WARNING UNIT. TM 55-1520-238-23.

AAG:

CHECK FOR OPEN BETWEEN (A402):
J3-A16 AND TB1-4-A
J3-A17 AND TB1-5-A
J3-A19 AND TB1-17-E
J3-A20 AND TB1-17-J.

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-33-1.

NO: REPLACE ENGINE-OUT WARNING UNIT. TM 55-1520-238-23.

END OF TASK

* U.S. GOVERNMENT PRINTING OFFICE : 1989 0 - 233-660

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

MILDRED E. HEDBERG
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

U.S. GOVERNMENT PRINTING OFFICE: 1989 - 233-660

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
COA, 3d ENGINEER BN
FT. LEONARDWOOD, MO 63108

DATE SENT

PUBLICATION NUMBER TM 55-1520-238-T-2	PUBLICATION DATE 15 Dec 85	PUBLICATION TITLE AVUM and AVIM Troubleshooting Manual for Army Model AH-64A Helicopter

BE EXACT . . . PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 Cylinders. The engine on my set only has 4 Cylinders. Change the manual to show 4 Cylinders.
81		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the Other.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got What I ordered, so the NSN is Wrong. Please give me a good NSN

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER JOHN DOE, PFC (268) 317-7111	SIGN HERE John Doe JOHN DOE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 1, 1 Nov 80

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER TM 55-1520-238-T-2	PUBLICATION DATE 15 Dec 85	PUBLICATION TITLE AVUM and AVIM Troubleshooting Manual for Army Model AH-64A Helicopter

BE EXACT . . . PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

TEAR ALONG PERFORATED LINE

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

TEAR ALONG PERFORATED LINE

DEPARTMENT OF THE ARMY

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

COMMANDER
U S ARMY AVIATION SYSTEMS COMMAND
ATTN: AMSAV-MPSD
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

TEAR ALONG PERFORATED LINE

DEPARTMENT OF THE ARMY

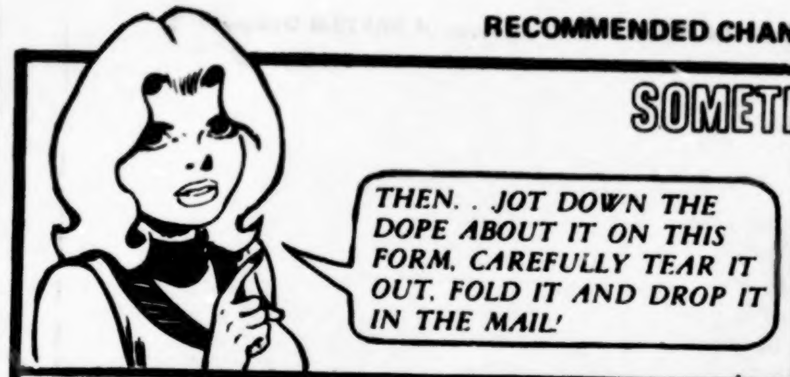
POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

COMMANDER
U S ARMY AVIATION SYSTEMS COMMAND
ATTN: AMSAV-MPSD
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS


THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)	
DATE SENT	

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 55-1520-238-T-2	15 Dec 85	AVUM and AVIM Troubleshooting Manual for Army Model AH-64A Helicopter

BE EXACT. . PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
DATE SENT

PUBLICATION NUMBER TM 55-1520-238-T-2
PUBLICATION DATE 15 Dec 85
PUBLICATION TITLE AVUM and AVIM Troubleshooting Manual for Army Model AH-64A Helicopter

BE EXACT. . PIN-POINT WHERE IT IS
PAGE NO | PARA-GRAPH | FIGURE NO | TABLE NO
IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER | SIGN HERE

DA FORM 1 JUL 79 2028-2
PREVIOUS EDITIONS ARE OBSOLETE.
DRSTS-M Overprint 2, 1 Nov 80.
P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

COMMANDER
U S ARMY AVIATION SYSTEMS COMMAND
ATTN: AMSAV-MPSD
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

COMMANDER
U S ARMY AVIATION SYSTEMS COMMAND
ATTN: AMSAV-MPSD
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.365	metric tons	short tons	1.102
pound-inches	mewton-meters	.11375			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C